CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dCDC/12	**Course name:** Citation in a Slovak scientific journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dCMG/12	**Course name:** Citation in a monograph
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: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	
abs	n
0.0	0.0
Provides:	
Date of last modification:	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dCZC/12	**Course name:** Citation in an international scientific journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	
abs	n
0.0	0.0
Provides:	
Date of last modification:	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dSVP/14	**Course name:** Co-researcher of an APVV or VEGA project
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 51	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dSVG/12	**Course name:** Co-researcher of an internal grant
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 58	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dSMP/14	**Course name:** Co-researcher of an international project
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 4	
abs	n
100.0	0.0
Provides:	
Date of last modification:	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dKOA/10	**Course name:** Combinatorial algorithms
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: 2., 4.	
Course level: III.	
Prerequisities:	
Conditions for course completion: Exam	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language: Slovak and English	
Notes:	
Course assessment Total number of assessed students: 14	

N	P
0.0	100.0

Provides: Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dKOM/10	**Course name:** Combinatorics

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: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Oral exam

Learning outcomes:

Brief outline of the course:
Finite combinatorics. Generating functions. Incidence structures. Distributive latices. Basis of infinite combinatorics. Almost disjoint set systems. Independence set systems. Infinite trees, their propertiesand a question of their existence. Some cardinal characteristics of the set of real numbers.

Recommended literature:
1. M. Aigner: Combinatorial Theory, Springer-Verlag, Berlin, 1997
2. B. Balcar a P. Štěpánek, Teorie množin, Academia, Praha 2000
3. B. Bollobás, Combinatorics, Cambridge University Press, Cambridge 1986
4. T. Jech, Set Theory, Springr-Verlag, Berlin 2002
5. Journal literatura

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 3

N	P
0.0	100.0

Provides: Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ VYMD/15	**Course name:** Computational complexity and models

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: 9

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Written test combined with an oral examination.

Learning outcomes:
Providing en extended backgroung in the area of efficient computations, computational complexity of algorithms, and fundamental time and space complexity classes, hardest complete problems, and about reducibility among problems.

Brief outline of the course:
Basic computational models; relations among different models with respect to their computational complexity; deterministic and nondeterministic computations; basic complexity classes - L, NL, P, NP, PSPACE, NPSPACE; reducibilities of problems; complete languages in basic complexity classes; hierarchy and translation theorems for time and space; relativization; alternating computations and hierarchies.

Recommended literature:
J.E. Hopcroft, R.Motwani, J.D. Ullman: Introduction to automata theory, languages, and computation, Addison-Wesley, 2007.
M. Sipser: Introduction to the Theory of Computation, Thomson, 2nd edition, 2006.
S. Arora, B. Barak: Computational Complexity: A Modern Approach, Cambridge Univ. Pess, 2009.
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.
G.Brassard, P.Bradley: Fundamentals of algorithmics, Prentice Hall, 1996.
Ch. H. Papadimitriou: Computational Complexity, Addison-Wesley, 1994.
D.P.Bovet, P.Crescenzi: Introduction to the theory of complexity, Prentice Hall, 1994.

Course language:

Notes:

Course assessment Total number of assessed students: 22	
N	P
0.0	100.0
Provides: prof. RNDr. Viliam Geffert, DrSc.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dDZS/14	**Course name:** Dissertation examination

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: III.

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:
The summary doctoral exam is organised as a discourse focusing on 3 courses serving as credit sources for a PhD student (the course is chosen by the supervisor of the student after consulting with the guarantee of the study programme).

Recommended literature:

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 16

N	P
0.0	100.0

Provides:

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ AJD1/07	**Course name:** English Language for PhD Students 1

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 584

N	Ne	P	Pr	abs	neabs
0.0	0.0	56.85	0.0	43.15	0.0

Provides: PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 03.10.2019

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ AJD2/07	**Course name:** English Language for PhD Students 2

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: 3

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 569

N	Ne	P	Pr	abs	neabs
0.0	0.0	92.44	1.41	6.15	0.0

Provides: PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD., Mgr. Barbara Mitríková

Date of last modification: 26.02.2020

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dEKO/10	**Course name:** Enumeration of combinatorial objects

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: 7

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

Course level: III.

Prerequisities:

Conditions for course completion:
A student is evaluated according to an oral examination.

Learning outcomes:
Student gets acquainted with Pólya's enumeration theory and on special examples sees how to use it when determining the number of some mathematical objects.

Brief outline of the course:
Cycle index of a permutation group. Burnside's Lemma. Pólya's Enumeration Theorem. Enumeration of injective functions. Enumeration of trees. Enumeration of graphs of given order and size. Enumeration of oriented graphs. Generalisations of Pólya's Enumeration Theorem.

Recommended literature:
F. Harary, E. M. Palmer: Graphical Enumeration, Academic Press, 1973

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 2

N	P
0.0	100.0

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTGF/10	**Course name:** Graph 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.

Course level: III.

Prerequisities:

Conditions for course completion:
Oral examination

Learning outcomes:
Knowledge some of basic and also up-to-date knowledge about graph theory. Ability of a creative scietific work.

Brief outline of the course:
Planar graphs. Colourings of graphs and their generalizations. Structural properties of plane graphs. Introduction to the theory of light graphs. Colourings of plane graphs. Cyclic colourings. Parity colourings. Nonrepetitive colourings. Rainbow colourings. Ramsey theory for graphs. Applications of graph theory.

Recommended literature:
1. J. A. Bondy and U.S.R. Murty, Graph Theory, Springer-Verlag, 2008
2. J.Bang-Jensen and G. Gutin: Digraphs: Theory, Algorithms and Applications, Springer-Verlag London, 2001
3. R. Diestel: Graph Theory, Springer-Verlag, New York, 1997
4. Časopisecká literatúra

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 46

N	P
0.0	100.0

Provides: doc. RNDr. Roman Soták, PhD., prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc., doc. RNDr. Jaroslav Ivančo, CSc., prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTGR/10	**Course name:** Group 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: 7

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
written and oral exam

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. Groups of permutations, cyclic index, Burnside´s lemma, Pólya´s theorem. Sylow´s 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: 44

N	P
0.0	100.0

Provides: doc. RNDr. Miroslav Ploščica, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dISLa/14	**Course name:** Individual study of scientific literature 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: 12	
Recommended semester/trimester of the course: 1., 2..	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language: Slovak and English	
Notes:	
Course assessment Total number of assessed students: 18	

abs	n
100.0	0.0

Provides:
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dISLb/14	**Course name:** Individual study of scientific literature 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: 12	
Recommended semester/trimester of the course: 3., 4..	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language: Slovak and English	
Notes:	
Course assessment Total number of assessed students: 19	

abs	n
100.0	0.0

Provides:
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTZV/10	**Course name:** Lattice 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: 5

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

Course level: III.

Prerequisities:

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

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:
Distributive and modular lattices, Boolean algebras. Ideals, reprezentation of distibutive lattices and Boolean algebras. Completeness and completions. Algebraic properties of lattices, congruence relations. 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 and English

Notes:

Course assessment
Total number of assessed students: 6

N	P
0.0	100.0

Provides: doc. RNDr. Miroslav Ploščica, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTMT/10	**Course name:** Matroid 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: 7

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

Course level: III.

Prerequisities:

Conditions for course completion:
A student is evaluated according to an oral examination.

Learning outcomes:
A student gets acquainted with special parts of matroid theory and with possibilities how to use them in various disciplines of discrete mathematics.

Brief outline of the course:
Restriction, contraction, minor of a matroid. Connected matroids. Whitney's Theorem. Graph homeomorphisms versus matroid minors. Planar graphs and their duals. Representation of a matroid in a vector space. Binary matroids. Block designs versus matroids. Extremal problems in matroids. Greedy algorithm versus matroids.

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

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 10

N	P
10.0	90.0

Provides: prof. RNDr. Mirko Horňák, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dZMG/14	**Course name:** Obtaining of a mobility grant
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 10	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 2	
abs	n
100.0	0.0
Provides:	
Date of last modification:	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dUAS/10	**Course name:** Ordered algebraic structures

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: 2., 4.

Course level: III.

Prerequisities:

Conditions for course completion:
examination

Learning outcomes:
To acquire fundamentals of theory of ordered algebraic structures connecting them with obtained knowledge of algebra, to distend and generalize; application on concrete exercises and mathematical problems.

Brief outline of the course:
Partially ordered, linearly ordered, lattice ordered groups. Convex subgroups, absolute value and orthogonality, order of factor classes. Archimedean ordered structures. Partially ordered and linearly ordered rings, fields, lattice ordered rings.

Recommended literature:
L.Fuchs: Partially ordered algebraic systems, Pergamon Press, 1963.
T.S.Blyth: Lattices and Ordered Algebraic Structures, Springer Verlag, London, 2005.
E.Harsheim: Ordered sets, Springer Verlag, 2005.
G.Grätzer: Universal algebra, Second Edition, Springer 2008.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 11

N	P
0.0	100.0

Provides: prof. RNDr. Danica Studenovská, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ ODP/14	**Course name:** PhD thesis 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: 30	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 20

N	P
0.0	100.0

Provides:
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dPLT/10	**Course name:** Polyhedral 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: 7

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
Oral exam.

Learning outcomes:
Mastered basic knowledge and results of theory of convex polyhedra on up-to-date level..

Brief outline of the course:
Polyhedral maps on surfaces. Combinatorial structure of polyhedra. Polyhedral graphs. Euler's formula. Steinitz theorem for 3-dimensional polyhedra. Schlegel's diagrams. Gale's diagrams. Face and vertex structure of polyhedra. Moredimensional polyhedra.

Recommended literature:
1. W. Cook, P.D. Seymour: Polyhedral Combinatorics, American Society, 1990.
2. B. Grunbaum: Convex Polytopes, (2-nd edition), Springer-Verlag New York, 2003
3. E. Jucovič: Convex polytopes. Veda, Bratislava, 1981
4. G.M. Ziegler: Lectures on Polytopes, Springer-Verlag, New York, 1995
5. Journal references.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 7

N	P
0.0	100.0

Provides: Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPDK/12	**Course name:** Presentation of results at a local 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: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 19	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPDZ/12	**Course name:** Presentation of results at a local conference with international participation
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: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 87	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dVMK/14	**Course name:** Presentation of results at an international 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: 6	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 72	
abs	n
100.0	0.0
Provides:	
Date of last modification:	
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPSM/12	**Course name:** Presentation of results in a seminar

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 133

abs	n
100.0	0.0

Provides:

Date of last modification:

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dCSC/12	**Course name:** SCI or SCOPUS citation
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: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 12	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPNC/12	**Course name:** Scientific publication in non-current content journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 18

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPNZ/12	**Course name:** Scientific publication in non-reviewed proceedings
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 30	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPRZ/12	**Course name:** Scientific publication in peer-reviewed proceedings
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 26	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPCR/12	**Course name:** Scientific publication registered in the database Math. Reviews or Zentralblatt MATH
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 15	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 9

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPCW/12	**Course name:** Scientific publication registered in the database Web of Science or Scopus
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: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 52

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dVTGa/10	**Course name:** Selected topics in graph theory I

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: 7

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
Mastering some of the recent trends in graph theory.

Brief outline of the course:
Selected topics from up-to-date graph theory

Recommended literature:
Recent publications from international scientific journals.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 23

N	P
0.0	100.0

Provides: doc. RNDr. Roman Soták, PhD., prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc., doc. RNDr. Jaroslav Ivančo, CSc., prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dVTGb/10	**Course name:** Selected topics in graph theory II

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: 7

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Oral examination

Learning outcomes:
Knowledge about up-to-date trends in the graph theory.

Brief outline of the course:
Selected topics from up-to-date graph theory.

Recommended literature:
Recent literature from international scientific journals

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 24

N	P
0.0	100.0

Provides: doc. RNDr. Roman Soták, PhD., prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc., prof. RNDr. Danica Studenovská, CSc., doc. RNDr. Jaroslav Ivančo, CSc., prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: Dek. PF UPJŠ/JSD/14	**Course name:** Spring School for PhD Students
Course type, scope and the method: **Course type:** Lecture **Recommended course-load (hours):** **Per week: Per study period:** 4d **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 135

abs	n
100.0	0.0

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTPG/14	**Course name:** Theory of Planar Graphs

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: 7

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

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To obtain the knowledge on basic and advanced topics related to planar and plane graphs.

Brief outline of the course:
Basics of topology of the plane. Planar and plane graphs. Characterizations of planarity. Euler formula and its corollaries. Local structure of planar and plane graphs, the discharging method. Proper and generalized colourings of planar and plane graphs. Separators in planar graphs.

Recommended literature:
T. Nishizeki, N. Chiba: Planar graphs: Theory and Algorithms, Dover Publications, 2008
S. Jendroľ, H-J. Voss: Light subgraphs of graphs embedded in the plane - A survey, Discrete Mathematics Vol. 313, no. 4 (2013) 406-421.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 0

N	P
0.0	0.0

Provides: prof. RNDr. Tomáš Madaras, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ dPDS/14	**Course name:** Thesis to the summary doctoral exam
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 15	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Obtaining required number of credits as given 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 or English	
Notes:	
Course assessment Total number of assessed students: 14	

abs	n
100.0	0.0

Provides:
Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dTTG/10	**Course name:** Topological graph 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: 7

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

Course level: III.

Prerequisities:

Conditions for course completion:
Skúška

Learning outcomes:
Oboznámiť sa so základnými metódami a poznatkami Topologickej teórie grafov.

Brief outline of the course:
Planárne grafy. Plochy. Vnorenia. Napäťové grafy a pokrývajúce priestory. Rod grafov. Rody grúp. Farbenia grafov na plochách. Neodstraniteľné konfigurácie. Reprezentativita grafov na plochách. Stromová šírka grafov. Minory. Zakázané konfigurácie pre plochy.

Recommended literature:
1. G. Gross, T.W. Tucker: Topological Graph Theory, John Wiley and Sons, New York, 1987
2. B. Mohar, C., Thomassen: Graphs on Surfaces,The Johns Hopkins University Press, Baltimore, 2001
3. G. Ringel: Map Color Theorem, Springer-Verlag, Berlin, 1974
4. Journal articles

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 26

N	P
0.0	100.0

Provides: doc. RNDr. Roman Soták, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/ dUAL/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: III.

Prerequisities:

Conditions for course completion:
Exam consisting of a written test and of a oral examination.

Learning outcomes:
To continue in obtaining a deeper knowledge in universal algebra and in its generalization; to be able to apply the knowledge in investigating concrete situations.

Brief outline of the course:
Relations, operations, algebraic structures. Congruences, homomorphism and isomorphism theorems. Application to abstract automata and other structures. Automorphism groups and endomorphism monoids of algebraic structures, abstract and concrete representation problem. Subalgebras. Direct and subdirest product. Direct and inverse limit of algebras. Terms. Free algebras. Birkhoff theorems about varieties. Structures and 1st order logic.

Recommended literature:
G. Grätzer: Universal Algebra, 2nd Edition, Springer Verlag, Berlin - New York, 2008.
S.Burris, H.P.Sankappanavar: A Course in Universal Algebra. Springer-Verlag, 1981;
online http://orion.math.iastate.edu/cliff/BurrisSanka.pdf.
V.P.Snaith: Groups, Rings and Galois Theory, Word Scientific Publ. Co.,New Jersey-London-Singapore, 2003.
M. Kolibiar a kol.: Algebra a príbuzné disciplíny, Bratislava, 1992.
B. Jónsson: Topics in Universal Algebra, Springer-Verlag, 1972.

Course language:
Slovak and English

Notes:

Course assessment
Total number of assessed students: 14

N	P
0.0	100.0

Provides: prof. RNDr. Danica Studenovská, CSc.

Date of last modification: 03.05.2015
Approved: prof. RNDr. Mirko Horňák, CSc., Dr.h.c. prof. RNDr. Stanislav Jendroľ, DrSc.