Course descriptions

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COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-DAV-212/22	Advanced methods for analysis and visualization of data in practice

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Continuing evaluation: homework assignments (50%), project (50%)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
Students will be able to analyze datasets of different sizes, pre-process them into a visualizable form as well as identify and practically apply different methods of data visualization using the Python programming language.

Class syllabus:
An introduction to the practical use of the Python programming language and the Pandas data processing library. The matplotlib library. Advanced plotting of graphs using the seaborn library (statistical distributions, confidence intervals, "heat maps", ...). Interactivity in data visualization using the Plotly library. Visualization of high-dimensional data. Methods for visualization of textual data. Data visualization in the context of machine learning.

Recommended literature:

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Marek Šuppa

Last change: 27.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-INF-115/00	Algebra (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
homework, tests, written and oral final exam
Grading: A 90%, B 80%, C 70%, D 60%, E 50%, Fx < 50%
Scale of assessment (preliminary/final): Semester 40% (30% tests + 10% homework) / 60% final exam (30% test + 30% oral exam).

Learning outcomes:
Understanding of basic notions and methods of linear algebra and ability to use them to solve various theoretical and practical problems.

Class syllabus:
Basic notions necessary for building abstract vector spaces (group, fields, vector spaces). Subspaces, linear dependence and independence of vectors, Steinitz theorem, basis of vector space. Matrices. Linear mappings. Composition of linear mappings. Inverse matrices. Solutions of hommogenous and nonhomogenous systems of linear equations. Determinants, basic properties and applications.

Recommended literature:
Lineárna algebra a geometria : Cesta z troch rozmerov s presahmi do príbuzných odborov / Pavol Zlatoš. Bratislava : Albert Marenčin, 2011; elektronická verzia dostupná na http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf
Algebra a teoretická aritmetika 1 / Tibor Katriňák ... [et al.]. Bratislava : Univerzita Komenského, 2002
Pěstujeme lineární algebru / Luboš Motl, Miloš Zahradník. Praha : Karolinum, 2002
Linear algebra done right / Sheldon Axler. New York : Springer, 1997
Custom course materials published on the course website.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 932

A	B	C	D	E	FX
19,42	10,41	13,84	12,98	26,93	16,42

Lecturers: RNDr. Martin Sleziak, PhD., doc. RNDr. Jaroslav Guričan, CSc., Mgr. Marcel Makovník, PhD., RNDr. Barbora Pokorná, PhD., Mgr. Nina Hronkovičová

Last change: 18.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-INF-156/22	Algebra (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 4.

Educational level: I.

Prerequisites: FMFI.KAG/1-INF-115/00 - Algebra (1)

Course requirements:
Exam
Grading scale: A 90%, B 80%, C 70%, D 60%, E 50%, Fx < 50 %
Scale of assessment (preliminary/final): Semester 30% (20% tests + 10% homework) / 70% final exam (20% test + 50% oral exam).

Learning outcomes:
Students will be familiar with the most important concepts, results, methods and algorithms of linear algebra (for example computing canonical forms of matrices and other invariants with respect to congruence and similarity) with connections to geometry, computer graphics and computer science. Students will be able to actively use this knowledge in other disciplines.

Class syllabus:
Scalar product, orthonormal basis and orthogonal projection to a subspace. Quadratic forms and their canonical forms. Positive (semi-)definite matrices and quadratic forms and criteria for verifying definiteness. Change of basis, similar matrices. Similarity to a diagonal matrix. Eigenvalues and eigenvectors, characteristic polynomial. Orthogonal matrices, orthogonal similarity, Schur theorem, principal axes theorem. Symmetrical polynomials. Rings of polynomials, factorization into irreducible polynomials, (multiple) roots, derivative and Taylor expansion.

Recommended literature:
Lineárna algebra a geometria : Cesta z troch rozmerov s presahmi do príbuzných odborov / Pavol Zlatoš. Bratislava : Albert Marenčin, 2011;http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf
Algebra a teoretická aritmetika 1 / Tibor Katriňák ... [et al.]. Bratislava : Univerzita Komenského, 2002
Electronic course notes published on the course web page

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 522

A	B	C	D	E	FX
21,07	11,88	13,79	15,9	26,63	10,73

Lecturers: RNDr. Martin Sleziak, PhD., doc. RNDr. Jaroslav Guričan, CSc., Mgr. Adriana Malovec Bosáková, PhD.

Last change: 22.05.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/2-INF-182/22	Algebra (3)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-115 Algebra (1) and 1-INF-156 Algebra (2)

Course requirements:
Individual work, test, final exam
Grading: A 90%, B 80%, C 70%, D 60%, E 50%, Fx < 50%
Scale of assessment (preliminary/final): Semester 20% (test) / 80% final exam (40% test + 40% oral exam).

Learning outcomes:
Understanding of basic notions and methods from group theory, ring theory and field theory and ability to use them to solve various theoretical and practical problems.

Class syllabus:
Groups, subgroups, homomorphisms, quotient groups. Rings, ideals, maximal ideal and prime ideals, their relationship to fields and integral domains when creating quotient rings. Euclidean domains, principal ideal domains, unique factorization domains. Divisibility and unique factorization. Field extensions. Finite fields and their classification. Some applications of field extension and finite fields. Fast Fourier transform and multiplication of large integers. (The choice of topics each academic year may vary, based on the interests of the students.)

Recommended literature:
Algebra a teoretická aritmetika 1 / Tibor Katriňák ... [et al.]. Bratislava : Univerzita Komenského, 2002
Lineárna algebra a geometria : Cesta z troch rozmerov s presahmi do príbuzných odborov / Pavol Zlatoš. Bratislava : Albert Marenčin, 2011
Electronic course notes published at the course web page

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 152					
A	B	C	D	E	FX
46,05	15,79	14,47	11,84	8,55	3,29
Lecturers: RNDr. Martin Sleziak, PhD., doc. RNDr. Jaroslav Guričan, CSc.					
Last change: 18.06.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-220/00	Algorithms and Data Structures

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Recommended prerequisites:
1-INF-166 Programming (2) in Java or 1-AIN-170 Programming (2)

Course requirements:
To complete the course, it is necessary to obtain at least 70% of points during the semester. The grade is based on a final written exam and an optional oral exam.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Students will be familiar with basics of design and analysis of efficient algorithms and data structures. The students will be able to analyze the time complexity of basic algorithms, to use basic algorithmic techniques (sorting and searching arrays), use basic efficient data structures and understand their implementation.

Class syllabus:
Asymptotic running time analysis, methods of estimation, notation. Sorting: meargesort, heapsort, quicksort; sorting in linear time. Data structures: priority queues, hash tables, binary search trees and their balancing. Efficient algorithm design techniques: dynamic programming, greedy algorithms.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
Algorithms in C : Parts 1-4 : Fundamentals, data structures, sorting, searching / Robert Sedgewick. Boston : Addison-Wesley, 1998
Custom course notes published at the course website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 741

A	B	C	D	E	FX
39,81	15,11	14,3	11,88	12,28	6,61

Lecturers: prof. RNDr. Rastislav Kráľovič, PhD., RNDr. Šimon Sádovský, PhD.

Last change: 23.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-278/18	Analytic and Enumerative Combinatorics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
2-INF-277/18 Complex Analysis for Computer Scientists or 1-MAT-416/15 Theory of Complex Variable Functions

Course requirements:
homework assignments, written and oral exam
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will understand the key methods of analytic combinatorics and will be able to apply their theoretical knowledge on the fields of combinatorial enumeration and algorithm analysis. They will also get acquainted with selected techniques and results of classical enumerative combinatorics.

Class syllabus:
The algebra of formal power series. Unlabelled and labelled combinatorial structures, ordinary and exponential generating functions, the symbolic method and its connection to formal languages. Generating functions as analytical objects, their singularities, Pringsheim's theorem. Singularity analysis and its applications. Coefficients of rational, meromorphic, and algebraic functions. The saddle-point method and its applications. Multivariate analytic combinatorics. Selected topics in classical enumerative combinatorics: Cayley's formula, Möbius inversion over locally finite posets, Pólya's theory.

Recommended literature:
Electronic materials on the course website.
Analytic Combinatorics / Philippe Flajolet, Robert Sedgewick. Cambridge : Cambridge University Press, 2009
Notes on Counting: An Introduction to Enumerative Combinatorics / Peter J. Cameron. Cambridge : Cambridge University Press, 2017
Analytic Combinatorics: A Multidimensional Approach / Marni Mishna. Boca Raton : CRC Press, 2019
Algorithmic and Symbolic Combinatorics / Stephen Melczer. Cham : Springer, 2021

Analytic Combinatorics in Several Variables / Robin Pemantle, Mark C. Wilson. New York : Cambridge University Press, 2013
Introductory Combinatorics, 5th ed. / Richard A. Brualdi. Upper Saddle River : Pearson, 2010
Kapitoly z diskrétní matematiky, 3rd ed. / Jiří Matoušek, Jaroslav Nešetřil. Prague : Karolinum, 2007
Algebraic Combinatorics, 2nd ed. / Richard P. Stanley. Cham : Springer, 2018
Discrete Calculus: Methods for Counting / Carlo Mariconda, Alberto Tonolo. Cham : Springer, 2016

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 6

A	B	C	D	E	FX
66,67	0,0	0,0	0,0	16,67	16,67

Lecturers: RNDr. Peter Kostolányi, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-316/20	Application Programming in C++

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KAI/1-AIN-171/10

Course requirements:
The student must submit all assigned tasks within the exercises and the tasks must be taken over by the instructors. He can get 60 points for solved tasks. The exam is written and for 40 points. The final grade is determined by the sum of points obtained for the exercises and for the exam.

Learning outcomes:
The student will gain deeper knowledge and skills of the C ++ programming language. Mainly from the latest C ++ 14 standard, as well as from the new as yet unpublished C ++ 17 and other technical specifications. The focus will be on the principles of operation of new constructions and how to use them in practice to simplify and clarify the code. The graduate will know the cost of abstractions and their impact on the memory and time requirements of the program. Practical examples will be cross-platform.

Class syllabus:
1. Introduction to C ++ language, its key features and comparison with C language.
2. Basics of C ++, "Hello world!" program, primitive types, conditions, loops, range based for loops, constants, references and pointers.
3. The most important concept in C ++ - Scope, the lifecycle of objects.
4. Object-oriented programming (encapsulation, inheritance and polymorphism).
5. Standard C ++ library (STL), presentation of the most useful classes (vector and string) and their properties.
6. Other containers from std :: (map, set, unordered map, ...) their comparison and possible implementation.
7. Errors in programs, compilation errors and warnings, asserts, return codes from functions, errno access, exceptions, error handling.
8. Move semantics. 9. Automatic type deduction, rules and pitfalls. Function pointers, function objects, and lambdas as a replacement for anonymous functions.
10. Multithreaded programming.
11. Repetition and further development of C ++

Recommended literature:
Scott Meyers: Effective Modern C++. O'Reilly Media, 2014. 336 s. (http://shop.oreilly.com/product/0636920033707.do)
Standard C++ Foundation (https://isocpp.org/)
STROUSTRUP, B. A Tour of C++, Addison-Wesley, 2014, ISBN 9780321958310

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 28

A	B	C	D	E	FX
35,71	21,43	10,71	10,71	14,29	7,14

Lecturers: Mgr. Peter Koscelanský

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-318/22	Application security and secure programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 26 / 13
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 7.

Educational level: I.

Prerequisites:

Recommended prerequisites:
FMFI.KI/1-INF-127/15 - Programming (1) in C/C++, FMFI.KI/1-INF-166/11 Programming (2) in Java

Course requirements:
homeworks, written and oral exam.
Assessment (approx.): A 92%, B 84%, C 76%, D 68%, E 60%.
More detailed information is available on the website.
Scale of assessment (preliminary/final): 35/65

Learning outcomes:
After completing the course, students will know the basic techniques for developing secure applications (desktop and web). They will also get acquainted with the security of databases, containers, mobile applications and the Internet of Things.

Class syllabus:
Secure programming of classic and web applications (identification and authentication, static and dynamic code analysis, covert channels, buffer overflow, Y2K problem, code injection, logging, ...). Database access control, integrity and availability. Comparison of security of containers and virtual machines. Security aspects of machine learning. Application security (security requirements, protection of production data in development, integration of security into the software life cycle, ...).

Recommended literature:
Daniel Deogun, Dan Johnsson, Daniel Sawano. Secure By Design. Manning, 2019, ISBN-13: 978-1617294358.
Dafydd Stuttard, Marcus Pinto. The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws. Wiley, 2011, ISBN-13: 978-1118026472.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Richard Ostertág, PhD., doc. RNDr. Martin Stanek, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KI/1-INF-991/22	**Course title:** BSc Project
Number of credits: 10	
Educational level: I.	
Prerequisites: FMFI.KI/1-INF-920/15 - BSc Seminar (2)	
Course requirements: Submission of the bachelor thesis and its defence.	
Learning outcomes: By completing and defending bachelor theses, students will demonstrate their ability to work in the area of computer science.	
Class syllabus: Defense of the bachelor thesis.	
State exam syllabus:	
Last change: 08.03.2022	
Approved by: doc. RNDr. Dana Pardubská, CSc.	

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-911/15	BSc Seminar (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:
During the semester: Active participation, presentations, homework.
During exam period: submission of a part of the bachelor thesis.
Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website.
Scale of assessment (preliminary/final): 55/45

Learning outcomes:
Students will be familiar with thesis requirements. They will select a thesis topic and a supervisor, find appropriate literature and submit the first portion of the thesis text.

Class syllabus:
Types of theses, their structure. Planning the thesis work, analyzing the problem. Student presentations of selected topics.

Recommended literature:
Ako písať vysokoškolské a kvalifikačné práce : Ako písať seminárne práce, ročníkové práce, práce študentskej vedeckej a odbornej činnosti, diplomové práce, záverečné a atestačné práce, dizertácie / Dušan Katuščák. Bratislava : Stimul, 1998

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 239

A	B	C	D	E	FX
68,62	18,41	7,11	3,35	0,42	2,09

Lecturers: doc. RNDr. Dana Pardubská, CSc., doc. Mgr. Tomáš Plachetka, Dr., doc. RNDr. Robert Lukoťka, PhD.

Last change: 27.10.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-920/15	BSc Seminar (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 8.

Educational level: I.

Prerequisites:

Course requirements:
During the semester: Active participation, presentations, homework.
During exam period: presentation, bachelor thesis submission.
Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website.
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be able to present the results of their bachelor theses.

Class syllabus:
Student presentations, discussion.

Recommended literature:
Ako písať vysokoškolské a kvalifikačné práce : Ako písať seminárne práce, ročníkové práce, práce študentskej vedeckej a odbornej činnosti, diplomové práce, záverečné a atestačné práce, dizertácie / Dušan Katuščák. Bratislava : Stimul, 1998

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 238

A	B	C	D	E	FX
79,41	8,4	1,68	0,84	0,42	9,24

Lecturers: doc. RNDr. Dana Pardubská, CSc., doc. Mgr. Tomáš Plachetka, Dr., doc. RNDr. Robert Lukoťka, PhD.

Last change: 27.10.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-KXX-007/20	Basics of Mathematics (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments.
The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests.
Grading: A (100-92), B (91-84), C (83-76), D (75-68), E (67-60), Fx (<60).
Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test).

Learning outcomes:
Students will gain the necessary skills in manipulation with numbers, mathematical expressions, elementary functions. They will expand their knowledge of geometry.

Class syllabus:
1. Mathematical terminology and mathematical logic. Basics of proper mathematical expression and designation.
2. Logical formulae and proofs. Types of mathematical proofs illustrated in elementary examples.
3. Sets and number sets (basic operations with numbers and expressions, numbers, various notations, fractions). Numbers and their geometric representation on a line (absolute value and its geometric meaning).
4. Elementary number theory, divisibility, prime numbers, compound numbers.
5. Expressions, linear and quadratic expressions with variables. Properties of mathematical operations (commutation, distribution, simplification, etc.)
6. Elementary functions (polynomial, linear, quadratic, n-th power and n-th root, trigonometric, exponential, logarithmic functions, their properties and calculation). The graph of a real function and its basic properties.

7. Equations and inequalities of one variable (linear and quadratic, with absolute value, with n-th power and n-th root, trigonometric, exponential, logarithmic). Calculator vs. adjustment before enumeration.

Recommended literature:
Základy matematiky / Mário Boroš : Ikar, 2016
Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 105

A	B	C	D	E	FX
9,52	26,67	20,95	6,67	2,86	33,33

Lecturers: RNDr. Martina Bátorová, PhD.

Last change: 18.10.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-KXX-017/20	Basics of Mathematics (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments.
The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests.
Grading: A (100-92), B (91-84), C (83-76), D (75-68), E (67-60), Fx (<60).
Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test).

Learning outcomes:
Students will acquire the necessary skills in mathematical operations with complex numbers, combinatorics, basics of probability and statistics, and analytical and synthetic geometry in the plane and space.

Class syllabus:
8. Basics of calculating sequences and series (arithmetic and geometric sequence, partial sums) and their applications.
9. Linear equations and inequalities with two or three unknowns and their solutions. Equation and inequalities with parameters.
10. Elementary analytical geometry in the plane (vectors, lines, triangle, polygon, circle, conic section, scalar product) and its relationship with solutions of equations. Isometries and similarities in plane.
11. Elementary analytical geometry in space (planes, vector product). Basic bodies and their imaging.
12. Complex numbers, calculations and their geometric properties (representations, basic operations, complex n-th power and n-th root, Moivre's theorem)
13. Basic combinatorial procedures without using the traditional formulae

14. Basic concept of probability and statistics (reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator)
15. Limits via geometric and computational methods (basic rules of calculating limits, derivatives of elementary functions, graphs of functions and their properties)

Recommended literature:
Základy matematiky / Mário Boroš : Ikar, 2016
Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 83

A	B	C	D	E	FX
10,84	13,25	21,69	18,07	4,82	31,33

Lecturers: RNDr. Martina Bátorová, PhD.

Last change: 18.10.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-407/22	Brain and Mind

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 1., 3., 5.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Continuous assessment: presence (30%), presentation (40%), bonus assignments (30%)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The course objectives are to make the students familiar with major theories and methods of mind/ brain research.

Class syllabus:
The subject of the course is the human mind and brain from the perspective of neuroscience, computer science, psychology, and philosophy. It is mainly focused on the interdisciplinary study of consciousness: its neural correlates, neuroscience and behavioral research methods, and major theories.

Recommended literature:
S. Blackmore, E.T. Troscianko: Consciousnes. An Introduction. Routledge, third edition 2018.
M.S. Gazzaniga, R.B. Ivry, G.R. Mangun: Cognitive Neuroscience. The Biology of the Mind. W.W. Norton & company, fifth edition 2019.
J. Friedenberg, G. Silverman: Cognitive Science. An Introduction to the Study of Mind. Sage 2012.
T. Metzinger: The Ego Tunnel. The Science of the Mind and the Myth of the self. Basic Books 2009.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 235					
A	B	C	D	E	FX
50,64	15,32	13,19	9,79	2,98	8,09
Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.					
Last change: 04.07.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-408/22	Cognitive Laboratory

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3., 5.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Interim evaluation: presentations
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Acquisition of methods for studying various cognitive phenomena (data collection and analysis) using an online cognitive laboratory.

Class syllabus:
Demonstration of 40 standard experiments in the fields of neurocognition, mechanisms of perception, attention systems, memory processes, speech production and perception, knowledge representation (concepts and mental ideas), judgment and decision-making processes.

Recommended literature:
CogLab / Greg Francis, Ian Neath, Daniel R. VanHorn. Thomson/Wadsworth, 2014

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 94

A	B	C	D	E	FX
64,89	12,77	9,57	1,06	0,0	11,7

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-420/18	Combinatorial Analysis (1)

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI.KI/1-INF-420/15

Course requirements:
Written exam
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The students are aware of basic methods for computing finite sums, solving recurrent relations, deriving and solving combinatorial relations, finite calculus; they understand the basic theory of ordinary generating functions and can practically apply it; they can derive simple asymptotic estimates.

Class syllabus:
Linear recurrent relations and methods used to solve them. Finite sums, double and triple sums, transformation of summation range. Iverson bracket. Finite calculus. Integer functions. Sums involving integer and fractional parts. Combinatorics: generalised binomial theorem, binomial coefficients and sums over them, combinatorial identitites. Basics of generating functions. Application of generating functions to solving recurrent relations. Introduction to asymptotic analysis. Asymptotic hierarchy of functions. Stirling formula applications.

Recommended literature:
Concrete Mathematics : A Foundation for Computer Science / Ronald L. Graham, Donald E. Knuth, Oren Patashnik. Upper Saddle River : Addison-Wesley, 1994

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 29

A	B	C	D	E	FX
41,38	13,79	10,34	17,24	6,9	10,34

Lecturers: doc. RNDr. Daniel Olejár, PhD., doc. RNDr. Martin Stanek, PhD., doc. RNDr. Ján Mazák, PhD.

Last change: 28.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-INF-810/15	Competitive Programming (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI+KZVI/1-INF-810/00

Course requirements:

Learning outcomes:
Improvement of skills necessary for fast, correct and efficient implementation of programming tasks. Preparation for programming competitions.

Class syllabus:
Implementation of solutions of given algorithmic tasks in modern programming languages. Emphasis is placed on fast and correct implementation of efficient algorithms and on time-efficient debugging of programs. One of the goals of these exercises is to prepare for programming competitions such as the ACM ICPC.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
The algorithm design manual / Steven S Skiena. London : Springer, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 425

A	B	C	D	E	FX
49,41	10,35	7,76	9,65	18,82	4,0

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI+KAI/1-INF-815/15	Competitive Programming (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI+KZVI/1-INF-815/00

Course requirements:

Learning outcomes:
Improvement of skills necessary for fast, correct and efficient implementation of programming tasks. Preparation for programming competitions.

Class syllabus:
Implementation of solutions of given algorithmic tasks in modern programming languages. Emphasis is placed on fast and correct implementation of efficient algorithms and on time-efficient debugging of programs. One of the goals of these exercises is to prepare for programming competitions such as the ACM ICPC.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
The algorithm design manual / Steven S Skiena. London : Springer, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 388

A	B	C	D	E	FX
46,65	10,31	8,76	7,99	21,65	4,64

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-INF-820/15	Competitive Programming (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI+KZVI/1-INF-820/00

Course requirements:

Learning outcomes:
Improvement of skills necessary for fast, correct and efficient implementation of programming tasks. Preparation for programming competitions.

Class syllabus:
Implementation of solutions of given algorithmic tasks in modern programming languages. Emphasis is placed on fast and correct implementation of efficient algorithms and on time-efficient debugging of programs. One of the goals of these exercises is to prepare for programming competitions such as the ACM ICPC.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
The algorithm design manual / Steven S Skiena. London : Springer, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 256

A	B	C	D	E	FX
62,11	5,86	8,98	8,98	10,94	3,13

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI+KAI/1-INF-825/15	Competitive Programming (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI+KZVI/1-INF-825/00

Course requirements:

Learning outcomes:
Improvement of skills necessary for fast, correct and efficient implementation of programming tasks. Preparation for programming competitions.

Class syllabus:
Implementation of solutions of given algorithmic tasks in modern programming languages. Emphasis is placed on fast and correct implementation of efficient algorithms and on time-efficient debugging of programs. One of the goals of these exercises is to prepare for programming competitions such as the ACM ICPC.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
The algorithm design manual / Steven S Skiena. London : Springer, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 215

A	B	C	D	E	FX
56,28	7,91	6,98	6,51	18,6	3,72

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-INF-830/00	Competitive Programming (5)

Educational activities:
Type of activities: laboratory practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:
Improvement of skills necessary for fast, correct and efficient implementation of programming tasks. Preparation for programming competitions.

Class syllabus:
Implementation of solutions of given algorithmic tasks in modern programming languages. Emphasis is placed on fast and correct implementation of efficient algorithms and on time-efficient debugging of programs. One of the goals of these exercises is to prepare for programming competitions such as the ACM ICPC.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
The algorithm design manual / Steven S Skiena. London : Springer, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 140

A	B	C	D	E	FX
55,0	12,14	8,57	6,43	16,43	1,43

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-KXX-002/20	Complementary Classes in Mathematics (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students gain basic skill in computation with numbers, mathematical expressions, elementary functions. They extend the knowledge on elementary geometry.

Class syllabus:
1. Basic operations with numbers and expressions (numbers, notation, fractions, linear and quadratic expressions with variables, commutativity, distributivity, simplification, etc.)
2. Relations of numbers and their geometric representation on a straight line, absolute value and its geometric significance, equations and inequalities with one variable and absolute value
3. Elementary functions (polynomials, roots, sin, cos, exp, ln) and their relations, properties and computing with them, equations and inequlities, calculator vs. adjustment before enumeration.
4. Linear equations with two, three unknowns and their solution
5. Elementary analytical geometry in plane and space (vectors, straight lines, plane, triangle, circle, cone, solids) and link with the solutions of equations

Recommended literature:
Lecturer materials.

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 84

A	B	C	D	E	FX
35,71	7,14	14,29	10,71	16,67	15,48

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., RNDr. Klaudia Hamajová
Last change: 22.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-KXX-012/20	Complementary Classes in Mathematics (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A (100-92), B (91-84), C (83-76), D (75-68), E (67-60), Fx (<60)
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students extends their knowledge and skills in mathematical operations with complex numbers, combinatorics, basic probability and the description of elementary functions.

Class syllabus:
6 . complex numbers, computation and their geometric properties
7. elementary number theory, divisibility, prime numbers, graphs
8. basic combinatorial methods and solutions without the help of traditional formulas
9. basic notion of probability and statistics, reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator
10. basics of calculating sequences and series, partial sums, applications (interest, ...)
11. concept of limits geometrically and computationally, basic rules of limit calculation, derivatives of elementary functions, course of function
12. logic and the need for proof illustrated in elementary examples

Recommended literature:
Lecturers materials.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 68

A	B	C	D	E	FX
29,41	11,76	13,24	17,65	7,35	20,59

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., Mgr. Adriana Malovec Bosáková, PhD.
Last change: 25.10.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-KXX-001/20	Complementary Classes in Physics (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
A:90%, B:80%, C:70%, D:60%, E:50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.

Class syllabus:
Complex problems in the context of water (hydrostatic force in a liquid, Archimedes' law, continuity equation for liquids and gases, Bernoulli's equation for liquids, resistive force when moving a solid in a liquid)
Complex tasks in the context of electricity and magnetism (motion of a charged particle in a homogeneous electric and in a homogeneous magnetic field, motion of a conductor in a magnetic field, motion of a magnet in a coil)
Complex tasks in the context of sound (origin of sound, speed of sound propagation, equation of gradual waves, standing waves on a stretched string and on an air column, sound interference)
Complex tasks in the contexts of photoelectric effect and X-rays.

Recommended literature:
Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006
Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013
Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012
Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 70

A	B	C	D	E	FX
30,0	20,0	11,43	12,86	7,14	18,57

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-KXX-011/20	Complementary Classes in Physics (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
A:90%, B:80%, C:70%, D:60%, E:50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.

Class syllabus:
Complex problems in the context of translational motion of a point mass (force action, momentum, force impulse, Newton's laws of motion, elastic and inelastic collision, explosion, force action for circular motion).
Complex problems in the context of a rigid body (moment of inertia, energy of a rotating body)
Complex problems in the context of air (ideal gas, ideal gas phenomena, Avogadro's constant, internal energy of a body, heat capacity, energy transfer by flow, conduction and radiation, movement of a body in air).
Complex problem in the context of light (beam optics, dispersion, interference and diffraction of light, black body radiation, light and energy levels of atoms)
Complex problem in the context of energy conservation law.
Complex problem in the context of conservation laws (energy, momentum, electric charge)

Recommended literature:
Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006
Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013
Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012

Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016
Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013
Fyzika 2 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 47

A	B	C	D	E	FX
34,04	4,26	19,15	21,28	6,38	14,89

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-277/18	Complex Analysis for Computer Scientists

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
homework assignments, written and oral exam
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will build up a general picture of the field of complex analysis and master some more specialised topics qualifying them for the course of analytic and enumerative combinatorics.

Class syllabus:
Complex arithmetic, topology of the complex plane, functions of a complex variable. Derivative of a complex variable function, Cauchy-Riemann conditions, holomorphic functions. Power series and analytic functions. Properties of some elementary functions. Integration in the complex plane. Cauchy's integral theorem for triangles and convex regions, homotopies, Cauchy's integral theorem for simply connected regions. Cauchy's integral formula, Liouville's theorem, the fundamental theorem of algebra, Cauchy's integral formula for derivatives. Talyor series and the equivalence of holomorphicity with analyticity. The uniqueness theorem. Laurent series, isolated singularities of single-valued functions. Winding number of a curve about a point. Morera's theorem. General variants of Cauchy's integral formula and Cauchy's integral theorem. Cauchy's residue theorem. Cauchy's argument principle. The maximum modulus principle. Multi-valued analytic functions, analytic continuation, monodromy theorem. Singularities and their classification, Puiseux series. Algebraic functions and their singularities. The gamma function and its properties, Stirling's approximation.

Recommended literature:
Electronic materials on the course website.
Introduction to Complex Analysis / H. A. Priestley. Oxford : Oxford University Press, 2003
Real and Complex Analysis, 3rd ed. / Walter Rudin. New York : McGraw-Hill, 1987
Complex Analysis / Andrei Bourchtein, Ludmila Bourchtein. Singapore : Springer, 2021
Theory of Functions of a Complex Variable, Vol. 3 / A. I. Markushevich. Englewood Cliffs : Prentice-Hall, 1967
Complex Analysis / Lars Ahlfors. New York : McGraw-Hill, 1979

Complex Variables and Applications, 8th ed. / James Ward Brown, Ruel V. Churchill. Boston : McGraw-Hill, 2009
Classical Complex Analysis / Liang-Shin Hahn, Bernard Epstein. Sudbury : Jones and Bartlett Publishers, 1996
Základy analýzy v komplexním oboru / Milan Šulista. Prague : SNTL, 1981
Analýza v komplexním oboru / Milan Šulista. Prague : SNTL, 1982

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 8

A	B	C	D	E	FX
75,0	0,0	0,0	0,0	0,0	25,0

Lecturers: RNDr. Peter Kostolányi, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-167/15	Computational Complexity and Computability

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 39 / 13
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:
homework assignments, oral exam
Scale: A 90%, B 80%, C 70%, D 65%, E 60%

Learning outcomes:
Student will be familiar with basic concepts and results in computational complexity and computability theory.

Class syllabus:
RAM and its variants, register and Turing machines, recursive functions, computations and computability equivalence in different models. Church thesis, existence of undecidable problems. Basic complexity classes and relationships between them, existence of hard problems. NP-hardness, Cook theorem and selected important NP-complete problems, relationship between decision and optimization problems. P vs NP, different approaches to defining efficient algorithms (approximation and randomized algorithms). PSPACE-complete problems.

Recommended literature:
Computational complexity : A modern approach / Sanjeev Arora, Boaz Barak. New York : Cambridge University Press, 2009
Introduction to the Theory of Computation / Michael Sipser. Boston: Thomson, 2006

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 257

A	B	C	D	E	FX
35,02	10,51	14,79	12,84	16,73	10,12

Lecturers: doc. RNDr. Dana Pardubská, CSc.

Last change: 21.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-130/00	Computer Architecture

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Final exam: both written and oral.
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%.
More detailed information is available on the website.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, the student has a mathematical and technical knowledge necessary for understanding the operation of digital computers. It also has a basic knowledge on the internal implementation of the computer and interaction of hardware devices with the operating system.

Class syllabus:
Positional number systems, encoding of information in computers, fixed and floating point arithmetics, Boolean functions and operators, disjunctive normal forms (DNF), minimization of DNF, implementation of basic Boolean functions by electrical circuits. Combinational circuits. Space and time complexity of circuits. Sequential circuits. RTL language, control units, design of digital systems, multiplication and division of integers. Principles and architecture of von Neumann computer. Arithmetic and logic unit, instructions, formats of instructions, address modes, instruction set. Memory: associative, virtual (paging and segmenting), cache, stack memory. Input/ output devices, the control of I/O. Processor: control and arithmetic, registers, interrupt processing, microprogramming. RISC-CISC, pipelining, parallel data processing. Architectures of selected processors.

Recommended literature:
Tannenbaum A.: Structured computer organization, Prentice Hall, London, 1990
Langholz G.: Elements of computer organization, Prentice Hall, London, 1990
David Patterson, L. Hennessy Computer Organization and Desiogn RISC-V Edition: The Hardware Software Interface, Morgan Kaufmann; 2nd edition (December 31, 2020)
Harris S. Digital Design and Computer Architecture: ARM Edition

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 1000

A	B	C	D	E	FX
12,7	9,8	13,3	12,8	22,3	29,1

Lecturers: doc. RNDr. Daniel Olejár, PhD., RNDr. Richard Ostertág, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-283/15	Computer Networks (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 26 / 13
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI/1-INF-260/00

Course requirements:
During semester: Exercises - practical assignments (50%), mid-term test (50%)
Final exam: written test (at least 50% required) and oral final exam (may be waived)
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be familiar with basic terminology of computer networks and principles of their operation. They will have practical experience with usage and configuration of technologies commonly used on local networks and on the internet.

Class syllabus:
Basic network terminology, layer models, OSI, TCP/IP
Physical layer - cables, wireless transmission
Data link layer - Ethernet, WiFi.
Network layer – IP, routing, ICMP, ARP.
Transport layer – UDP, TCP, NAT.
Application layer – DNS, DHCP, Web, Mail, FTP, ...
IPv6
Security – firewall, VPN, SSL/TLS, security at the application layer (Web, Mail).

Recommended literature:
Computer Networks / Andrew S. Tanenbaum, David J. Wetherall. Boston : Pearson education, 2011
Computer Networks / Andrew S. Tanenbaum. Upper Saddle River : Prentice-Hall, 2003
Data and computer communications / William Stallings. Upper Saddle River : Prentice-Hall, 2004

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2177

A	B	C	D	E	FX
13,55	15,11	18,51	24,76	17,91	10,15

Lecturers: RNDr. Jaroslav Janáček, PhD., Ing. Dušan Bernát, PhD., doc. RNDr. Daniel Olejár, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-183/15	Computer Networks (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 26 / 13
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-283

Course requirements:
practical assignments during semester, written final test (at least 50% required) and oral final exam (may be waived)
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be familiar with principles and practical application of advanced technologies in computer networks and data communication.

Class syllabus:
802.1q, STP, DOCSIS , IP routing protocols (BGP, OSPF), advanced topics in TCP (syn-cookies, ECN, ...).
Theoretical principles of data transmission, maximal bandwidth, CRC, modulation techniques, multiplexing, FDMA, TDMA, CDMA, synchronous and asynchronous links, PPP.

Recommended literature:
Computer Networks / Andrew S. Tanenbaum, David J. Wetherall. Boston : Pearson education, 2011
Computer Networks / Andrew S. Tanenbaum. Upper Saddle River : Prentice-Hall, 2003
Data and computer communications / William Stallings. Upper Saddle River : Prentice-Hall, 2004

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 167

A	B	C	D	E	FX
27,54	35,33	25,15	8,38	2,4	1,2

Lecturers: RNDr. Jaroslav Janáček, PhD., doc. RNDr. Daniel Olejár, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-145/15	Creating Internet Applications

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Course requirements:
Project, written and oral exam with practical component.
Approximate grading scale: A 94%, B 88%, C 81%, D 75%, E 69%.
More detailed information is available on the website.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be able to implement internet applications using selected modern technologies, software engineering practices and complex application framework.

Class syllabus:
Selected modern technologies: client-side scripting (JavaScript, jQuert), raster (canvas) and vector (SVG, D3) client-side graphics rendering, two-way communication between the server and the client (WebSockets). Complex application framework (e.g. React). Security of internet applications.

Recommended literature:
Douglas Crockford. JavaScript: The Good Parts: The Good Parts. O'Reilly Media, 2008, ISBN-13: ‍978-0596517748.
Vanessa Wang, Frank Salim, Peter Moskovits. The Definitive Guide to HTML5 WebSocket. Apress, 2013, ISBN-13: ‍978-1430247401.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 225

A	B	C	D	E	FX
18,22	16,44	20,89	17,33	14,22	12,89

Lecturers: RNDr. Richard Ostertág, PhD., doc. RNDr. Martin Stanek, PhD., RNDr. Jana Kostičová, PhD.

Last change: 22.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-178/15	Cryptology (1)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
Homework assignments,
Condition for qualifying for the exam: timely and correctly solved all homework assignments,
Exam: written exam,
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The students will have the knowledge of basic cryptographic constructions; they will understand security guarantees provided by these constructions, and assumptions required for their security. The students will be able to choose a suitable cryptographic construction for given application / information system.

Class syllabus:
symmetric ciphers (block and stream ciphers), asymmetric ciphers, underlying problems for asymmetric constructions, hash functions, message authentication codes, digital signatures, passwords, secret sharing schemes, cryptographic protocols and related attacks, zero-knowledge proofs

Recommended literature:
Douglas R. Stinson, Maura Paterson: Cryptography: Theory and Practice, Chapman and Hall/ CRC; 4th edition, 2018
Nigel P. Smart: Cryptography Made Simple, Springer, 2016
Jean-Philippe Aumasson: Serious Cryptography: A Practical Introduction to Modern Encryption, 2017
Other on-line resources

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 131					
A	B	C	D	E	FX
10,69	10,69	16,03	16,03	26,72	19,85
Lecturers: doc. RNDr. Martin Stanek, PhD.					
Last change: 28.06.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-270/15	Design and Evaluation of User Interfaces

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 14

A	B	C	D	E	FX
57,14	28,57	0,0	14,29	0,0	0,0

Lecturers: Sapan Bhatia, PhD.

Last change: 02.05.2016

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-310/00	Design of Efficient Algorithms

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 39 / 13
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KI/1-INF-220/00 - Algorithms and Data Structures and (FMFI.KI/1-INF-160/00 - Introduction to Combinatorics and Graph Theory or FMFI.KAI+KI/1-DAV-101/20 - Discrete Mathematics)

Course requirements:
To complete the course, it is necessary to obtain at least 70% of points during the semester. The grade is based on a final written exam and an optional oral exam.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Student will be able to apply basic methods of efficient algorithm design and to analyze time complexity of algorithms

Class syllabus:
Basic graph problems and their effective solutions (e.g. algorithms for finding the shortest paths, the minimum spanning trees, articulations and bridges in graphs)
Data structures (Union/Find-Set problem, interval trees, RMQ and LCA)
The principles of efficient algorithm design (including particular applications) (e.g. dynamic programming, greedy algorithms, balancedness and the choice of an appropriate data structure)
Algorithm for problems from other areas of informatics (e.g. string matching, convex hull, modular arithmetic)

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 720

A	B	C	D	E	FX
38,89	19,44	15,0	14,03	9,58	3,06

Lecturers: Mgr. Michal Anderle, PhD., prof. RNDr. Rastislav Kráľovič, PhD., Mgr. Jozef Rajník, PhD.
Last change: 23.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-233/13	English Conversation Course (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3., 5.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
tests, presentations, essays
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational English as well as English for specific purposes appropriate for university students. This course is a follow up of the previously taught ESP course.

Class syllabus:
This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge.

Recommended literature:
Appropriate study material is supplied based on the participants'level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 291

A	B	C	D	E	FX
75,26	9,62	4,81	1,37	1,03	7,9

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-234/13	English Conversation Course (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4., 6.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
tests, oral presentations, essays
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Continual improvement of all language skills focused on communication/speaking, listening comprehension and writing. The emphasis is on discourse, lexicology and morphology, word-bank broadening of communicational/spoken English as well as English for specific purpose appropriate for university students. This course is a follow up of the Conversational English course 1.

Class syllabus:
This course's focus is to broaden spoken/communicational English for students with B2/C1 level of English knowledge(Upper-Intermediate/Lower Advanced).

Recommended literature:
Appropriate study material is supplied based on the participants'level of English by the lecturer. (Sources- The Guardian, The Herald Morning Sun. The Nine News, The West Australian, BBC News and podcasts, CNN podcasts).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 201

A	B	C	D	E	FX
82,09	8,96	2,49	1,0	0,0	5,47

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-131/00	English Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.

Class syllabus:
On entering the first semester, students´ knowledge of English is tested and they are divided into groups according to the results of the placement test. In the groups of pre-intermediate and intermediate students, fundamentals of technical English are taught. Advanced students take classes of technical English for their field of study: English for mathematics, for physics, for computer science, English for management and economic and financial mathemathics.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 7132

A	B	C	D	E	FX
29,54	23,11	18,17	12,56	7,84	8,78

Lecturers: Mgr. Eva Foltánová, Mgr. Ing. Jana Kočvarová, Mgr. Ľubomíra Kožehubová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-132/00	English Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the subject is to provide the students with experience and knowledge of technical English and thus make them ready to use English sources of information for later study and professional career.

Class syllabus:
This is a continuation of the course English (1) designed for pre-intermediate students. Fundamental vocabulary is presented through selected topics in mathematics, physics and informatics. The lessons also contain revision of elementary grammar. Generally, it is a necessary preliminary to advanced programs.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1733

A	B	C	D	E	FX
22,1	20,95	23,83	14,77	11,08	7,27

Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.
Last change: 20.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-231/00	English Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The objective of the classes is to provide the students with knowledge of technical English in their field of study and experience with technical English sources sufficient to make the able to use technical language for their later study and professional purposes.

Class syllabus:
The subject continues the program of English (2). Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathemathics.
The subject requires advanced knowledge of general English.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1422

A	B	C	D	E	FX
15,47	19,06	22,78	18,35	18,0	6,33

Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-232/10	English Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Examination: an examination consisting of a written and an oral part.
Grades: A 93%, B 85%, C 77%, D 70%, E 65%
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/skuska-z-predmetu-anglicky-jazyk-4/
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students will be able to work independently with professional literature in English

Class syllabus:
Students take classes of special English for their field of study: English for mathematics, English for physics, English for computer science, English for management and economic and financial mathemathics.

Recommended literature:
Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 4292

A	B	C	D	E	FX
25,19	28,1	21,6	11,84	6,06	7,22

Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 17.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-319/22	Forensic analysis

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 8.

Educational level: I.

Prerequisites:

Course requirements:
Ongoing evaluation: project work
Examination: final examination
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
By completing the course, the student will gain the knowledge necessary for the unquestionable collection and analysis of digital evidence in the investigation of security incidents. The student will be acquainted with the principles and procedures for forensic analysis of computer systems of the most common platforms.

Class syllabus:
1.Introduction to forensic analysis - introductory concepts and legal aspects. Available tools and investigation procedure. Preparation of the system investigation.
2. Analysis of disk and file systems - interfaces, hdd and ssd, different levels of file system abstraction from the point of view of forensic analysis, FAT, NTFS, ext4, APFS
3. Analysis of operational memories - specifics of image acquisition for investigation. Other hard disk artifacts. Simple investigation tools, volatility tool.
4. Investigation of Windows user stations - narrowing the amount of necessary data. Basic data sources: registers, logs, prefetch, recent, AppData and others
5. Investigation of user stations with Linux OS - differences from Windows OS. Data Sources - The location of various files that record user and operating system activity.
6. Investigation of mobile operating systems - specifics of mobile platforms. Security models. Ways of obtaining data. Get data without access to a mobile device.
7. Forensic malware analysis - tools for malware analysis. Examples of existing infiltrations. Cyberkill chain.
8. Investigation of network communication - basics of network communication. Preparation and implementation. Search for anomalies.
9. Antiphoresis techniques - legal use of these techniques. Digital fingerprint minimization. Steganography. Digital watermarks.

Recommended literature:

CARRIER, B. File System Forensic Analysis. New York: Addison-Wesley, 2005. 569 s. ISBN 0-32-126817-2.
Arnes, A., Digital Forensics. John Wiley & Sons Ltd. 2018, s 336. ISBN: 981119262381
Lin, Xiaodong. Introductory Computer Forensics: A Hands-on Practical Approach. Springer, 2018. 576 s. ISBN 9783030005801
M. H. Ligh, A. Case, J. Levy a A. Walters. The Art of Memory Forensics: Detecting Malware and Threats in Windows, Linux, and Mac Memory. John Wiley & Sons, 2014. 912 s. ISBN 1118825098

Languages necessary to complete the course:

Notes:

Past grade distribution

Total number of evaluated students: 1

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers:

Last change: 09.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-215/14	Formal Languages and Automata (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
homework, test, written and oral final exam
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be familiar with basic models of automata and grammars, and they will be ale to compare their computational power. They will understand algorithmic problem (un)decidability and a formal definition of computational complexity of a problem.

Class syllabus:
Chomsky hierarchy of formal grammars. Finite state automata and pushdown automata. Basic properties of regular and context-free languages, regular expressions. Turing machines. Undecidable problems. Introduction to computational complexity theory.

Recommended literature:
The Mathematical theory of context free languages / Seymour Ginsburg. New York : McGraw Hill, 1966
Formálne jazyky a automaty / John E. Hopcroft, Jeffrey D. Ullmanm ; preložili Branislav Rovan, Peter Mikulecký. Bratislava : Alfa, 1978
Introduction to Automata Theory, Languages, and Computation / John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman. Boston : Pearson/Addison-Wesley, 2007

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 724

A	B	C	D	E	FX
19,75	5,52	4,56	20,44	33,43	16,3

Lecturers: prof. RNDr. Branislav Rovan, PhD., RNDr. Peter Kostolányi, PhD.

Last change: 08.02.2018
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-186/15	Formal Languages and Automata (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 6., 8.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-215 and 1-INF-220

Course requirements:
Homework assignments and semester tests, final written and oral exam.
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students are familiar with properties of all classes in the Chomsky hierarchy. They understand the concept of decidability and complexity and know decidability status of basic problems for individual classes of the Chomsky hierarchy. They are familiar with basic methods of syntactic analysis and their connection to deterministic push-down automata.

Class syllabus:
Regular languages (characterization by equivalence relations). Finite state transducers. Context-sensistive grammars, linear bounded automata. Properties of language classes in the Chomsky hierarchy. Decidable and undecidable problems in the Chomsky hierarchy. Deterministic context-free grammars and basic methods of syntactic analysis.

Recommended literature:
Introduction to Automata Theory, Languages, and Computation / John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman. Boston : Pearson/Addison-Wesley, 2007
Gries, David. "Compiler construction for digital computers." Wiley (1971).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 116

A	B	C	D	E	FX
53,45	11,21	12,93	9,48	8,62	4,31

Lecturers: prof. RNDr. Branislav Rovan, PhD., RNDr. Peter Kostolányi, PhD.
Last change: 10.02.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-141/00	French Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
French language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of French.

Recommended literature:
Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 482

A	B	C	D	E	FX
48,76	19,09	17,01	8,09	2,07	4,98

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-142/00	French Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The subject continues the program of French language (1) and provides courses of essential and intermediate French language.

Recommended literature:
Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 307

A	B	C	D	E	FX
45,6	22,48	16,94	8,79	2,28	3,91

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-241/00	French Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The subject provides a course of intermediate French language, covering not only general, but also technical language.

Recommended literature:
Capelle Guy, Menand Robert: Le Nouveau taxi 1, Hachette FLE Paris, France 2009, ISBN 978-2-01-155548 - 9

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 120

A	B	C	D	E	FX
45,83	25,83	18,33	5,83	0,83	3,33

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-242/00	French Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The subject provides a course of intermediate French covering not only general, but also technical French language.

Recommended literature:
Menand Robert: Le Nouveau taxi 2, Hachette FLE, Paris, France 2009, ISBN 978-2-01-155551 - 9

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 79

A	B	C	D	E	FX
43,04	32,91	16,46	2,53	1,27	3,8

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-KXX-006/20	Fundamentals of Physics (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
The assessment consists of two tests, two seminar works and a final exam. Indicative rating scale: A 95%, B 90%, C 80%, D 70%, E 60%. Credits will not be awarded to a student who obtains a grade of less than 60%.
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.

Class syllabus:
Deepening and expanding knowledge of high school curricula in the areas of: ideal gas, temperature, kinetic theory of gases; heat conduction, flow and radiation; absolute black body radiation; direct current; energy conservation law and photoelectric effect; energy conservation law and Bernoulli's equation; X-ray absorption and attenuation of light in an optical fiber; periodic phenomena and sound.

Recommended literature:
Giancoli, D., Physics: Principles with applications, 6th edition
Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5.,
Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia
Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia
Elektronic materials in moodle.uniba.sk

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 75

A	B	C	D	E	FX
29,33	22,67	12,0	9,33	10,67	16,0

Lecturers: doc. RNDr. Peter Demkanin, PhD., PaedDr. Tünde Kozánek Kiss, PhD.

Last change: 07.11.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/1-MAT-815/00	Fundamentals of Physics (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 7.

Educational level: I.

Prerequisites: FMFI.KMANM/1-MAT-250/22 - Mathematical Analysis (4) or FMFI.KMANM/1-MAT-250/14 - Mathematical Analysis (4) or FMFI.KAMŠ/1-DAV-102/20 - Calculus (1) or FMFI.KMANM/1-INF-150/22 - Mathematical Analysis (2)

Recommended prerequisites:
1-MAT-150 Mathematical analysis (2) AND 1-MAT-160 Linear algebra and geometry (2)

Course requirements:
Semester grading based on homework.
Informative grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The course will enable the students to understand the basic physics concepts, terminology and notation, as well as the importance and usage of these. They will be familiar with the most important physics approaches and problems, they will know how to solve these and will be able to interpret them. They will have the necessary skills to independently study the basic physics and technical literature. The first semester concentrates on topics from mechanics, however students will be able to understand problems from other areas of physics as well.

Class syllabus:
kinematics and dynamics of a point mass, Newton laws of motion, potential forces, harmonic oscillator, central potentials, collisions, two body problem a and many body problem, dynamics of collections of point masses, waves and oscillations, inertial and non-inertial reference frames, laws of motion in non-inertial reference frames, introduction to special theory of relativity; it is possible to include different topics according to needs and interests of the students

Recommended literature:
Feynmanovy přednášky z fyziky s řešenými příklady 1/3 / Richard P. Feynman, Robert B. Leighton, Matthew Sands. Havlíčkův Brod : Fragment, 2001
Lecture notes by the lecturer available at the website of the course.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 81

A	B	C	D	E	FX
70,37	12,35	13,58	2,47	0,0	1,23

Lecturers: Mgr. Juraj Tekel, PhD.

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-KXX-016/20	Fundamentals of Physics (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
The assessment consists of two tests, two seminar works and a final exam. Indicative rating scale: A 95%, B 90%, C 80%, D 70%, E 60%. Credits will not be awarded to a student who obtains a grade of less than 60%.
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.

Class syllabus:
Deepening and expanding knowledge from high school in the areas of: mechanics of a point mass; Atwood's machine; decomposition of force into components, free body diagram; movement of a point mass in a circle, centrifuge; mechanical work, mechanical energy; application of energy conservation law; the rotational effect of the force and rotation of a rigid body around a fixed axis; fluid mechanics; magnetic and electromagnetic phenomena; basics of optics.

Recommended literature:
Giancoli, D., Physics: Principles with applications, 6th edition
Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5.,
Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia
Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia
Elektronic materials in moodle.uniba.sk

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 56

A	B	C	D	E	FX
25,0	7,14	7,14	10,71	28,57	21,43

Lecturers: doc. PaedDr. Viera Haverlíková, PhD., PaedDr. Tünde Kozánek Kiss, PhD.

Last change: 07.11.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-DAV-201/20	Fundamentals of Probability and Statistics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., I.II., II.

Prerequisites:

Antirequisites: FMFI.KAMŠ/2-INF-175/18

Course requirements:
Teaching period: written exams
Examination period: combined written and oral exam
Examination period weight: 70%
Evaluation (in %): A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0)
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
After finishing the course the students understand the mathematical foundations of probability and statistics. They can solve the most common types of probabilistic problems and execute the simplest statistical analyses.

Class syllabus:
Random events and probability, Independence of events, Conditional probability, General random variables, Distribution function, Discrete random variables and their basic types, Continuous random variables and their basic types, Numerical characteristics of random variables (for instance the mean value and the variance), Random vectors, Correlation and dependence of random variables, Law of large numbers, Central limit theorem, Introduction to the random variates generation, Introduction to the probabilistic information theory, Statistical inference for the simple random sample, Statistical inference for a pair of random samples, Statistical inference for the regression line, The fundamental principle of Monte-Carlo methods.

Recommended literature:
Probability and random processes / Geoffrey R. Grimmett, David R. Stirzaker. Oxford : Oxford University Press, 2001
Electronic materials of the lecturer

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 632

A	B	C	D	E	FX
19,3	11,23	15,03	21,52	22,63	10,28

Lecturers: doc. Mgr. Radoslav Harman, PhD., Mgr. Pál Somogyi, doc. Mgr. Lenka Filová, PhD., Dr. rer. nat. Tatiana Kossaczká, MSc.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KDMFI/1-KXX-020/25	Fundamentals of Programming (1)

Educational activities:
Type of activities: course
Number of hours:
per week: 6 **per level/semester:** 78
Form of the course: on-site learning

Number of credits: 8

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: homework, tests
Exam: solving computer tasks
It is necessary to obtain at least 90% of points to obtain A rating, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E.
Scale of assessment (preliminary/final): 70/30

Learning outcomes:
After completing the course, students will be able to write short, simple programs in Python and master the basic methods of debugging in their own programs.

Class syllabus:
Basic Python program structures: cycles, conditions, variables, functions, strings, files. Basics of algorithmization and finding of errors in programs.

Recommended literature:
Python programming : An introduction to computer science / John M. Zelle. Sherwood, Or. : Franklin, Beedle & Associates, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Michal Winczer, PhD.

Last change: 10.01.2025

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI+KDMFI/1-KXX-021/25	**Course title:** Fundamentals of Programming (2)
Educational activities: **Type of activities:** course **Number of hours:** **per week:** 6 **per level/semester:** 78 **Form of the course:** on-site learning	
Number of credits: 8	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Course requirements: Continuous assessment: homework, written tests Exam: solving computer tasks It is necessary to obtain at least 90% of points to obtain A rating, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E. Scale of assessment (preliminary/final): 70/30	
Learning outcomes: Students will get acquainted with the basic structures for storing data in Python. Through motivational examples, they will improve in writing and debugging simple programs and get acquainted with the basic principles of computer science.	
Class syllabus: Advanced structures in Python (lists, n-tuples, matrices). Algorithmization and program debugging. Motivational examples illustrating basic concepts of informatics. Examples of practical applications.	
Recommended literature: Python 3 : Výukový kurz / Mark Summerfield ; překlad Lukáš Krejčí. Brno : Computer Press, 2010 Sedem divov informatiky / Juraj Hromkovič ; preklad Michal Winczer. Ružomberok : Verbum, 2012	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Michal Winczer, PhD.

Last change: 10.01.2025

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-MAT-551/22	Geometry for Graphics (1)

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
Semestral work: Homeworks - 30% of the final grade
Final exam: Written and oral - 70% of the final grade
Student needs at least half of points from homeworks to be able to attend the final exam.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30% homework/ 70% final exam

Learning outcomes:
By completing the course, students will supplement and expand the knowledge of geometry necessary for the study and understanding of the means and methods of computer graphics. They will master the analytical geometry in point-vector form, including the matrix variant. They will also master the theory and practice of parallel and central projections from 3D to 2D and basic 2D and 3D transformations.

Class syllabus:
Euclidean spaces. Point-vector calculus. Affine and Cartesian coordinates. Subspaces. Parallelism and perpendicularity. Coordinate transformations. Orientation. Halfspaces. Linear combination of points. Barycentric coordinates. Cross-ratio. Affine maps of Euclidean spaces. Homogenneous part of an affine map. Homothety and translations. Analytic form of an affine transformation in affine and extended affine coordinates. The matrix of an affine transformation. The module of an affine transformation. Parallel projection of 3-space to plane and its analytic form. Standard types of parallel projections and their matrix analytic forms. Similarities and isometries. Rotations in 2D and 3D. Classification of isometries in 2D and 3D

Recommended literature:
Analytická a diferenciální geometrie / Bruno Budinský. Praha : Státní nakladatelství technické literatury, 1983
Methods of geometry / James T. Smith. New York : John Wiley , 2000
Electronic study materials

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 524

A	B	C	D	E	FX
21,37	14,5	19,08	20,04	17,37	7,63

Lecturers: Mgr. Ľudovít Balko, PhD., doc. RNDr. Pavel Chalmovianský, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-MAT-552/22	Geometry for Graphics (2)

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 8.

Educational level: I.

Prerequisites:

Course requirements:
Semestral work: Homeworks - 30% of the final grade
Final exam: Written and oral - 70% of the final grade
Student needs at least half of points from homeworks to be able to attend the final exam.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30% homework/ 70% final exam

Learning outcomes:
The graduate of the subject will know the basic concepts and characteristics of curves in the Euclidean plane or in the three-dimensional Euclidean space and solution of elementary problems in the projective extension of an Euclidean space using homogeneous coordinates.

Class syllabus:
Point and vector functions of one real variable. Parametrized curves. Tangent and osculating plane, Frenet frame of a curve. Length of a curve and natural parametrization of curve. Curvature of a curve. Torsion of a curve. Natural equations of a curve. Contact of curves. Singular points of curves. The envelope of an oneparametric system of curves. The projective extension of an Euclidean space. Points at infinity. Homogeneous coordinates. Subspaces and their equations.

Recommended literature:
Erwin Kreyszig, Differential Geometry, Dover Publications, Inc, New York, 1991
M. do Carmo, Differential Geometry of Curves and Surfaces, Prentice Hall, New Yersey, 1976
Electronic materials

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 314					
A	B	C	D	E	FX
23,25	11,78	16,24	20,7	26,11	1,91
Lecturers: Mgr. Ľudovít Balko, PhD., doc. RNDr. Pavel Chalmovianský, PhD.					
Last change: 22.06.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-151/00	German Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)

Class syllabus:
German language is taught at three levels: beginner, intermediate and advanced. Students opt for one of them depending on whether they need to learn the fundamentals or maintain and/or improve their previous knowledge.
This course's focus is to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)

Recommended literature:
Appropriate study material is supplied by teacher based on the participants'level of German proficiency.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 828

A	B	C	D	E	FX
37,56	25,48	18,6	9,18	2,78	6,4

Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Dobiašová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-152/00	German Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
To master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)

Class syllabus:
German language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of German.
This course's focus is to to master the fundamentals of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency)

Recommended literature:
Appropriate study material is supplied by teacher based on the participants'level of German proficiency

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 541

A	B	C	D	E	FX
37,89	19,59	19,59	12,38	3,51	7,02

Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Dobiašová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-251/00	German Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)

Class syllabus:
The course is a follow-up to the German language (1,2). The subject provides a course of intermediate or advanced German language.
This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).

Recommended literature:
Appropriate study material is supplied by teacher based on the participants'level of German proficiency.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 184

A	B	C	D	E	FX
44,02	23,91	20,11	6,52	2,17	3,26

Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Dobiašová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-252/00	German Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Master the basics of general language and basic professional terminology of individual fields of study (depending on the advanced level of students)

Class syllabus:
The course is a follow-up to the German language (1-3). It provides a course of intermediate and advanced German language.
This course's focus is to deepen the knowledge of the common language and basic technical terms of particular fields of study (depending on the student's level of German proficiency).

Recommended literature:
Appropriate study material is supplied by teacher based on the participants'level of German proficiency.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 104

A	B	C	D	E	FX
44,23	22,12	14,42	10,58	3,85	4,81

Lecturers: Mgr. Alexandra Maďarová, Mgr. Simona Dobiašová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-174/15	Graph Theory

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 39 / 13
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-160 Introduction to combinatorics and graph theory

Course requirements:
Approximate scale of evaluation: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80maximum 20% of evaluation can be obtain by solving homoworks

Learning outcomes:
The course will provide students with solid foundations of graph theory by proving key classical theorems and explaining the most important graph algorithms. Emphasis is also placed on motivation from other scientific disciplines and technology and possible applications of the covered topics.

Class syllabus:
Basic terminology: trees, bipartite graphs, graph and labyrinth search. Eulerian graphs. matchings in graphs, König's theorem, Hall theorem and its corollaries. measuring of graph connectivity. Menger's theorem, Planar graphs, Euler's theorem. Kuratowski's theorem. Graph coloring: some NP-hard problems, greedy algorithm. Brooks' theorem. Vizing's theorem. Coloring of planar graphs. Flows, Ford–Fulkerson algorithm and its applications. Integer and group flows, relationship to coloring. Hamiltonian graphs. Chvátal's theorem. Random graphs, probabilistic models, properties of random graphs.

Recommended literature:

Languages necessary to complete the course:
Slovak, English.

Notes:

Past grade distribution Total number of evaluated students: 156					
A	B	C	D	E	FX
39,74	18,59	16,03	10,26	10,26	5,13
Lecturers: doc. RNDr. Edita Mačajová, PhD.					
Last change: 28.06.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-INF-240/15	Graphical Systems, Visualization, Multimedia

Educational activities:
Type of activities: course
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 8.

Educational level: I., I.II.

Prerequisites:

Recommended prerequisites:
The class does not require content prerequisites.

Course requirements:
Ongoing evaluation: individual work
exam
Indicative grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The content of the course provides, in accordance with the recommendations of the ACM Computing Curriculum, basic knowledge in the areas of Graphics and Visual Computing, Human-Computer Interaction, and relevant topics for Social and Professional Issues.
Graduates will be able to create digital content with freely available tools in the field of computer graphics and scientific and visualization.

Class syllabus:
- Reference model of computer graphics, architecture of multimedia system, methodology of mathematical modeling and visualization, application areas of computer graphics, visualization and multimedia. International standardization (ISO, Web Consortium, EU standards). Visual computing - brief history, social implications, economic and copyright aspects. Intellectual Property.
- Graphic communication. Geometric modeling (creation of simple objects). Basics of rendering. Use of API (OpenGL). HCl. Basics of human-machine communication. Design of a simple interactive graphical interface (GUI).
- Physical and logical input devices. GUI programming. Interactive aspects of multimedia systems and communication. Coding of graphic and multimedia information. Data compression principle. Functional standards for computer graphics and image processing. Web consortium. De facto standards (OpenGL, window systems). Graphics system and GUI functionality specification. Coordinate systems. Homogeneous coordinates. Affine transformations (scaling, rotation, translation). Implement a simple display channel. Line clipping and rasterization (DDA, Bresenham algorithm).

- Implementation of basic 2D graphic elements: polyline, fill area, text. Image hierarchy and 2D computer animation. Simple color models (RGB, CMYK). The cultural significance of some. colors. Website design. Using text in pictures. Web publishing.
- Human perception. Analog and digital representations for multimedia. Image and sound processing. Basic functions for visualization. History of visualization. Visualization scenarios. Interactive multimedia titles. Introduction to 3D graphics. Visibility problem and z-buffer. Light sources. Parameters of camera. Scene graph. VRML standard. Interaction of light and objects. Local lighting model and shading (constant, Gouraud, Phong). Textures. Photorealistic rendering.
- 3D scene modeling. Parametric and implicit representation. CSG and B-rep. Procedural modeling (fractals and particle systems).
- Computer. animation. Computer games and virtual reality. Scanning, modeling and display of medical data.

Recommended literature:

Computer graphics and image processing (in Slovak) / Eugen Ružický, Andrej Ferko. Bratislava: Sapientia, 1995. [online] http://www.sccg.sk/~ferko/PGASO2012-bookmarks.pdf
Fundamentals of interactive computer graphics / James D. Foley, Andries van Dam. Reading: Addison-Wesley, 1983
Class materials available from the class website.

Languages necessary to complete the course:

English, Slovak

Notes:

The class is eventually taught in a distant mode, as well.

Past grade distribution

Total number of evaluated students: 1112

A	B	C	D	E	FX
24,91	26,35	21,67	11,33	7,46	8,27

Lecturers: doc. RNDr. Andrej Ferko, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-279/21	Hyperprogramming

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
ongoing evaluation: homework
exam: written/oral
estimated grading curve: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
The students master a new method of implementation of complex information systems, that allows to implement an example system (e.g. a database of books and authors) within minutes.

Class syllabus:
Extension of Object-Oriented Programming to the architecture dimension. New ways information systems implementation: Configuration-oriented programming; composite configuration - Hyperprogramming. Comparison of current and new ways of creation complex information systems. Application of theoretical concepts and models in practice.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
72,73	9,09	0,0	0,0	0,0	18,18

Lecturers: RNDr. Radovan Brečka, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-MXX-491/22	Inclusive Approaches to Education of Students with Special Educational Needs

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in class (elaboration of assigned tasks, participation in discussions)
An exam: -
Indicative assessment level: e.g. A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student:
- They will get acquainted with the basic characteristics of types of health disadvantage (HR) and will know the consequences of HR on education.
- Gain personal experience from meetings with people with disabilities and will be able to explain and apply the rules of communication with them.
- Can characterize the forms of education of students with SEN and assess the possibilities of their pedagogical, technical and human support, which positively affect the success of education.

Class syllabus:
- Characteristics of basic concepts.
- Disability models.
- Disability legislation.
- Human, communication, information and architectural barriers.
- Impact of disability on education.
- Segregation - integration - inclusion.
- Information access technologies for people with disabilities.
- Possibilities and limits of creating equal conditions for the education of pupils with specific educational needs.
- Inclusive school - education for all.
- The importance of education for the social inclusion of people with disabilities.

Recommended literature:

- Lechta, V. (ed): Inkluzivní pedagogika. Praha: Portál, 2016, ISBN 978-80-262-1123-5
- Slowík, J.: Komunikace s lidmi a postižením. Praha: Portál, 2010, ISBN 978-80-7367-691-9
- Kol. autorov: Od integrácie k inklúzii. VÚDPaP: Bratislava, 2018, ISBN 978-80-89698-27-1

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 105

A	B	C	D	E	FX
74,29	20,0	3,81	0,0	0,0	1,9

Lecturers: Mgr. Ľudmila Hlinová

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KI/1-INF-961/22	**Course title:** Informatics
Number of credits: 2	
Educational level: I.	
Course requirements: State oral exam Scale of assessment (preliminary/final): 0/100	
Learning outcomes: State exam for completing the bachelor degree requirements in the Computer Science program.	
Class syllabus: Computer architecture, programming, system programming, operating systems, computer networks, formal languages and automata, algorithms and data structures, design of efficient algorithms, principles of software design	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 12.03.2022	
Approved by: doc. RNDr. Dana Pardubská, CSc.	

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-160/00	Introduction to Combinatorics and Graph Theory

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites: FMFI.KI/1-INF-120/00 - Introduction to Discrete Structures

Course requirements:
test, homework, final exam
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be fmailiar with basic terminology, results, methods and algorithms from graph theory and combinatorics.

Class syllabus:
Combinatorics: basic types of combinatorial problems and basic notions. Permutations, variations, combinations. Pascal formula, binomial and polynomial theorem. Combinatorial identities, estatimations of combinatorial numbers. Inclusion/exclusion principle. Recurrence relations, generating functions. Summation methods. Graph theory: motivation problems. Definition of various types of graphs. Basic notions. Trees. Searching of graphs. Euler path, Hamiltonian cycles. Graph colouring. Planar graphs. Algorithms for finding the the minimum spanning tree.

Recommended literature:
Diskrétna matematika 1 : Úvod do teórie množín, teórie booleovských funkcií a matematickej logiky / Daniel Olejár, Škoviera Martin. Bratislava : Univerzita Komenského, 1992
Matoušek, Nešetřil, Kapitoly z diskétní matematiky, Praha, Karolinum, 2010. M-ALG-M-5ab

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 694

A	B	C	D	E	FX
21,04	10,37	23,2	24,21	14,12	7,06

Lecturers: doc. RNDr. Edita Mačajová, PhD., prof. RNDr. Martin Škoviera, PhD., Mgr. Jozef Rajník, PhD.

Last change: 14.02.2021
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-230/00	Introduction to Database Systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KAI/1-AIN-221/15 and FMFI.KAI/1-AIN-222/15

Course requirements:
homeworks, final exam
The evaluation is governed by the education quality system of Comenius University.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The students will get acquainted with application and implementation of database systems. They will learn to use query languages and design relational databases. They will learn the principles of transaction systems.

Class syllabus:
Data models, DBMS architecture, reality modeling, relational model, declarative query languages, relational algebra, relational database design theory (functional dependencies, keys, normal forms), transactions and transaction processing, data structures for multilevel memory.

Recommended literature:
S. Abiteboul, R. Hull, V. Vianu. Reading: Foundations of databases, Pearson Education, 1994
H. Garcia-Molina, J. D. Ullman, J. Widom: Database systems, The complete book. Prentice-Hall, 2008

Languages necessary to complete the course:
Slovak, English

Notes:
The lecture and exercises are complemented by the course Database Practicum, focused on gaining practical skills in working with databases.

Past grade distribution
Total number of evaluated students: 914

A	B	C	D	E	FX
17,4	11,05	15,86	12,14	17,51	26,04

Lecturers: doc. Mgr. Tomáš Plachetka, Dr., doc. RNDr. Ján Mazák, PhD.
Last change: 23.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-120/00	Introduction to Discrete Structures

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
test, written final exam
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be familiar with logical structure of mathematics, methods of mathematical proofs and discrete structures necessary for study of mathematics and informatics.

Class syllabus:
Propositional calculus. Quantified propositions. Mathematical proofs. Mathematical induction. Intuitive set theory and its paradoxes. Basic set relations and operations on sets. Sets cardinality. Finite, infinite, countable and uncountable sets.

Recommended literature:
Diskrétna matematika 1 : Úvod do teórie množín, teórie booleovských funkcií a matematickej logiky / Daniel Olejár, Škoviera Martin. Bratislava : Univerzita Komenského, 1992
Teória množín / Tibor Šalát, Jaroslav Smítal. Bratislava : Univerzita Komenského, 1995
Množiny a všeličo okolo nich / Lev Bukovský. Košice : Univerzita Pavla Jozefa Šafárika, 2005

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 938

A	B	C	D	E	FX
16,42	9,59	15,03	16,1	20,58	22,28

Lecturers: prof. RNDr. Martin Škoviera, PhD., doc. RNDr. Edita Mačajová, PhD., Mgr. Jozef Rajník, PhD.

Last change: 08.02.2018

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-520/00	Introduction to Information Security

Educational activities:
Type of activities: lecture
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 8.

Educational level: I.

Prerequisites:

Course requirements:
Final exam, A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The course provides an overview of information security, legal requirements for data protection and systems, threats and measures to eliminate the risks that arise from them. The student knows the classification of data, the method of risk analysis, the content of a security policy, the method of developing a security project as well as the basic standards and recommended procedures in the field of information security.

Class syllabus:
The role of information security. The major security attributes of information (confidentiality, availability, authenticity, integrity, privacy, etc.) Basic notions of information security (system, asset, threat, vulnerability, risk). Building a new or securing an existing IT system. Security projects (description of the system and of its environment, identification of relevant threats, qualitative risk analysis, contrameasures). Risk management (incident handling, disaster recovery, business continuity planning). Management of information security. Evaluation and certification of IT system/product. Introduction to cryptology and PKI.

Recommended literature:
1. Cybersecurity Body of Knowledge Resources & Publications (cybok.org)
2. NIST SP 800 series NIST Special Publication 800-series General Information
NIST
3. BSI Štandardy BSI - IT-Grundschutz (bund.de)
4. SO/IEC 27001 — Information security management systems — Requirements.
5. ISO/IEC 27002 — Code of practice for information security management.
6. ISO/IEC 27005 — Information security risk management.
7. Zákon č. 69/2018 Z. z. o kybernetickej bezpečnosti a o zmene a doplnení niektorých zákonov

8. Vyhláška Národného bezpečnostného úradu č. 362/2018, ktorou sa ustanovuje obsah bezpečnostných opatrení, obsah a štruktúra bezpečnostnej dokumentácie a rozsah všeobecných bezpečnostných opatrení
9. Zákon č. 95/2019 Z. z. o informačných technológiách vo verejnej správe a o zmene a doplnení niektorých zákonov
10. Vyhláška Úradu podpredsedu vlády Slovenskej republiky pre investície a informatizáciu č. 179/2020 Z. z., ktorou sa ustanovuje spôsob kategorizácie a obsah bezpečnostných opatrení informačných technológií verejnej správy

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1120

A	B	C	D	E	FX
12,77	9,91	19,38	35,36	22,05	0,54

Lecturers: doc. RNDr. Daniel Olejár, PhD., RNDr. Michal Rjaško, PhD.

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-210/22	Introduction to Mathematical Logic

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 3 **per level/semester:** 26 / 39
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 6.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI/1-INF-210/00

Course requirements:
homework and written assignments; written and oral exam
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Understanding of axiomatic approach to propositional and predicate calculus and related computational aspects (automated proving via tableaux; SAT and ILP solvers).

Class syllabus:
Language, semantics and syntax of propositional logic, axioms and deductive rules, compactness theorem, consistency and completness of propositional calculus; language, axioms and deductive rules of predicate calculus, compactness and consistency of predicate calculus; theories with equality; tableau and automated proving; SAT and ILP solvers.

Recommended literature:
Mendelson E. Introduction to Mathematical Logic. Chapman & Hall, London, 4th edition, 1997.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 127

A	B	C	D	E	FX
14,96	19,69	27,56	18,9	7,09	11,81

Lecturers: doc. RNDr. Robert Lukoťka, PhD., doc. RNDr. Ján Mazák, PhD.

Last change: 28.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-187/15	Introduction to Theory of Programming

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Course requirements:
Written tests
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Student will be familiar with principles of program abstraction with the goal to analyse properties of program control structures independently from a particular program interpretation, principles and methods of proving correctness of program correctness, foundations of formal semantics of imperative and recursive programming languages

Class syllabus:
Program schemes
- basic notions - standard scheme, interpretation, Herbrand interpretations, properties of program schemes
- decidability of basic properties - basic undecidability results, subclasses of schemes with decidable properties (free and Yanov schemes)
- comparative schematology - relations between classes of standard, structured and recursive schemes, partially interpreted schemes
Program correctness
- partial and total correctness - invariants, inductive formulas, weakest precondition, strongest postcondition
- proof methods - Floyd method, Hoare-like proof systems, used induction principles, proving properties of recursive programs
- systematic development of correct programs
Semantics of programs and languages
- program meaning - principles of operational, denotational and axiomatic semantics
- semantic domains - algebraic structure, construction of domains
- formal semantics - operational and denotational semantics of imperative and recursive programs, types and semantics
- comparison of operational and denotational semantics - imperative programs, recursive programs (correctness of computational rules, criteria of correctness)

Recommended literature:
Zohar Manna. Mathematical theory of computation. McGraw Hill, 1974
Prívara, I.: Úvod do teórie programovania, lecture notes, 2014 – pdf version

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 24

A	B	C	D	E	FX
33,33	12,5	8,33	12,5	25,0	8,33

Lecturers: RNDr. Igor Prívara, CSc., prof. RNDr. Rastislav Kráľovič, PhD., Mgr. Petra Hozzová

Last change: 13.09.2015

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-AIN-112/22	Introduction to Web Technologies

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1., 3.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KZVI/1-AIN-610/00

Course requirements:
Intermediate assessment: practical assignments
Exam: practical (at least 70% of the semester points are needed)
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
After completing the course, students will be able to create a correct web page (in HTML) with the correct structure and correctly formatted content. The design will be implemented using CSS and will be adapted to different devices (using MediaQueries or CSS framework). The pages will fulfil the basic conditions of accessibility for people with special needs.
Students will be introduced to the basics of JavaScript, which will allow them to work with HTML elements, edit CSS and work with forms.

Class syllabus:
- HTML: document structuring, content formatting elements, basic page elements including multimedia objects, code validation, tables, forms and their appropriate structuring.
- Cascading Style Sheets (CSS): properties and their values, selectors, pseudo-classes, properties for formatting fonts and text, tables and other objects, colors, backgrounds, lengths, units, box model, object placement, visual document formatting, styles for different devices, Media Queries, other CSS options with respect to current versions.
- Introduction to CSS frameworks, e.g. Bootstrap + responsive pages.
- Basic information on website accessibility.

Recommended literature:
actual documentation for each technology
w3schools.com
own electronic texts published on the website or in the Moodle environment

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1531

A	B	C	D	E	FX
32,01	11,37	11,63	13,65	12,15	19,2

Lecturers: PaedDr. Roman Hrušecký, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-618/22	Introduction to cyber security law

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3., 5.

Educational level: I.

Prerequisites:

Course requirements:
ongoing/final evaluation: 100/0
estimated grading curve: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
After completing the course Introduction to Cyber Security Law, the student will gain basic theoretical knowledge of cyber security. The student is able to orientate himself in the legal regulation in the field of cyber security from the perspective of international law, European Union law, as well as the legal order of the Slovak Republic.

Class syllabus:
1. Introduction to cyber security law
2. Cybersecurity and its place in the system of protection of fundamental human rights and freedoms
3. Cybersecurity ethics
4. Principles of cybersecurity
5. Cybersecurity and European Union law 1
6. Cybersecurity and European Union law 2
7. Cybersecurity and the legal order of the Slovak Republic 1
8. Cybersecurity and the legal order of the Slovak Republic 2
9. Cybersecurity, privacy and personal data protection
10. Cybersecurity and international law
11. Cybersecurity and new technologies
12. The future of cybersecurity regulation
13. Guest Lecture / Case Study Solution
14. Interim evaluation

Recommended literature:
Andraško, J., Mesarčík, M.: Právo kybernetickej bezpečnosti. Učebnica. Právnická fakulta, Univerzita Komenského v Bratislave, 2022.
Andraško, J. a kol. Právo informačných a komunikačných technológií 2. Bratislava: TINCT. 2021

Andraško, J. a kol. Zákon o kybernetickej bezpečnosti. Komentár. Bratislava: Wolters Kluwer SR, s.r.o. 2018.
Kolouch, J. a kol.: CyberSecurity. CZ-NIC, 2019.
Mesarčík, M.: Ochrana osobných údajov. Bratislava: C.H. Beck, 2020.
Olejár, Daniel a kol.: Informačná bezpečnosť. Bratislava, 2013.
Pačka, R.: CSIRT: v přední linii boje proti kybernetickým hrozbám. Brno: Centrum pro stadium demokracie a kultury, o.p.s. (CDK): Masarykova Univcerzita, 2019.
Polčák, R. a kol. Právo informačních technológií. Praha: Wolters Kluwer ČR, 2018.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: doc. JUDr. Jozef Andraško, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-KXX-003/20	Laboratory Practicals in Physics (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
A: at least 90%, B at least 80%, C at least 70%, D at least 60%, E at least 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will develop skills to empirically examine physical phenomena at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.

Class syllabus:
Measurement of physical quantities (length, mass, volume, time, temperature, force, gas pressure, electric current, electric voltage, magnetic induction, lighting, sound frequency)
Physical dependence (independent and dependent variable, experiment constants), dependence graph, dependence table, mathematical description of dependence.
Direct ratio and linear dependence. Linearization of nonlinear dependence by substitution and logarithmization.
Random and systematic error of a series of measurements.
Complete laboratory work - problem identification, formulation of hypotheses, selection of variables, design of apparatus, data collection and processing, formulation of conclusions, evaluation.
Real group computer-aided laboratory experiments focused on the following areas:
Hydrostatic compressive force in a liquid, Archimedes' law, Bernoulli's equation for a liquid, resistive force when moving a solid in a liquid, moving a conductor in a magnetic field, moving a magnet in a coil, sound generation, speed of sound propagation, standing waves on a stretched string and on an air column, sound interference).

Recommended literature:
Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006
Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 66

A	B	C	D	E	FX
3,03	9,09	25,76	25,76	10,61	25,76

Lecturers: doc. PaedDr. Viera Haverlíková, PhD., PaedDr. Lukáš Bartošovič, PhD.

Last change: 16.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-406/22	Language and Cognition

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 2., 4., 6.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Continuous assessment: presentations, bonus assignments
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Acquisition of the most important current theories and methods of studying natural language and cognitive processes.

Class syllabus:
The course focuses on the most important aspects of natural language research (the most complex cognitive function): basic properties of language (arbitrariness, generative productivity, dynamism, structuring at many levels), mechanisms of speech production and perception, language acquisition, innate and acquired factors of language development.

Recommended literature:
G. Dorren: Babel. Around the World in 20 Languages. Profile Books, 2019
S. Pinker: Language Instinct. ľBrilliance Audio, 2014
S. Pinker: The Stuff of Thought. Language as a Window Into Human Nature. Penguin Books 2008
S. Pinker: Words and Rules. The lngredients of Language. Basic Books 2015

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 172

A	B	C	D	E	FX
37,21	23,84	15,12	11,05	5,23	7,56

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-510/22	Linux - Principles and Means

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 1 / 1 **per level/semester:** 13 / 13
Form of the course: on-site learning

Type, volume, methods and workload of the student - additional information
talk, 1h/week, online synchronous
training, 2h/week, online synchronous

Number of credits: 3

Recommended semester: 5.

Educational level: I.

Prerequisites:

Recommended prerequisites:
1-AIN-500 Linux for Users

Antirequisites: FMFI.KAI/1-AIN-510/00

Course requirements:
Priebežné hodnotenie: practical computer exercises
Skúška: practical computer exam
Orientačná stupnica hodnotenia: A 92%, B 84%, C 76%, D 68%, E 60%

Learning outcomes:
Graduate:
- knows the principles of operation of the GNU/Linux operating system
- knows and understands the basic principles of GNU/Linux OS components such as process, file system, user management, access rights, ...
- recognizes and applies a set of commands according to administration-user scenarios
- knows and understands the basics of the network model
- applies encryption principles in GNU/Linux OS
- creates a "oneline compound command" or script to solve an administrative-user task
- creates a simple Makefile

Class syllabus:
- Virtual machine and package system
- File system
- Logical Volume Manager
- Redundant Array of Inexpensive Disks (RAID)
- File and directory rights system
- Processes
- Connecting computers and the Internet

- TCP and UDP transport layer network model
- Encryption, keys and ssh
- System initialization
- Apache and MariaDB
- Compiling and GNU Make

Recommended literature:

Languages necessary to complete the course:

Notes:
The tasks are solved in a specialized software tool, which also enables effective distance synchronous education.

Past grade distribution
Total number of evaluated students: 339

A	B	C	D	E	FX
64,9	9,14	9,14	5,31	5,9	5,6

Lecturers: doc. RNDr. Dušan Guller, PhD., RNDr. Marek Nagy, PhD., Mgr. Ján Kľuka, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-AIN-500/22	Linux for Users

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Type, volume, methods and workload of the student - additional information
talk, 1h/week, online synchronous
training, 2h/week, online synchronous

Number of credits: 2

Recommended semester: 2., 4.

Educational level: I.

Prerequisites:

Course requirements:
Priebežné hodnotenie: practical computer exercises
Skúška: practical computer exam
Orientačná stupnica hodnotenia: A 92%, B 84%, C 76%, D 68%, E 60%

Learning outcomes:
Graduate:
- knows the principle and function of the command line
- knows the principles of operation of the GNU/Linux operating system
- knows and understands the basic components of the GNU/Linux OS such as process, file system, user administration, access rights, ...
- recognizes and applies a set of commands according to scenarios
- creates a "oneline compound command" or a simple script to solve task assignment

Class syllabus:
- History and philosophy of GNU / Linux. Text console. File system navigation. (pwd, ls, cd, less, cat, man, w, exit, ssh, mosh, ...)
- Directories and files (mkdir, rmdir, rm, cp, mv, ...)
- Users, groups, redirects and search. Regular expressions. (id, su, passwd, grep, ...)
- File and directory attributes (chown, chgrp, chmod, ...)
- Text editor vim
- File content sorting and selection commands (sort, head, tail, nl, uniq, tac, shuf)
- File system searching (find)
- Processes (ps, top, kill)
- sed - stream editor
- Processing by awk
- Basics of bash scripts

Recommended literature:

Languages necessary to complete the course:

Notes:
The tasks are solved in a specialized software tool, which also enables effective distance synchronous education.

Past grade distribution
Total number of evaluated students: 1990

A	B	C	D	E	FX
43,57	15,38	14,62	9,65	9,85	6,93

Lecturers: Mgr. Ivor Uhliarik, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/1-INF-110/22	Mathematical Analysis (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
For the semester, the student can get 15 points for exercises, 40 points for written exams, the final written exam has a weight of 30 points, the final oral exam weighs 15 points. The student must obtain at least 45 points from the exercises, written exams and the final written exam, at least 15 points from the final written exam and at least 5 points from the final oral exam. Grading: A (91-100 points), B (81-90 points), C (71-80 points), D (61-70 points), E (51-60 points), Fx (0-50 points).
Weight of the ongoing / final assessment: ongoing assessment 55% (15% exercise + 40% written exams) / 45% (30% final written exam, 15% final oral exam).
Scale of assessment (preliminary/final): 55/45

Learning outcomes:
After completing the course, the student can use the apparatus of differential calculus of functions of one real variable in solving appropriate problems of theoretical and practical focus.

Class syllabus:
Real numbers, functions of real variables. Limit of the function, basic theorems on limits. Compact sets. Continuity of a function in a point and on a set, basic properties of continuous functions on intervalas and compact sets. Derivative and general rules for differentiation. Repeated differentiation. Mean value theorems. Applications of the derivative. L´Hospital´s rule. Taylor´s polynomials.

Recommended literature:
Rudin, Walter: Principles of mathematical analysis, ISBN 0-07-054235-X
Hildebrandt, Stefan: Analysis I, ISBN 3-540-42838-0
Forstter, Otto: Analysis I, ISBN 3-528-57224-8
Neubrunn, Tibor a Vencko, Jozef: Mathematical Analysis I, textbook of FMFI UK
Kubáček, Valášek: Cvičenia z Matematickej analýzy 1,2

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 857

A	B	C	D	E	FX
13,07	11,67	10,62	18,09	24,62	21,94

Lecturers: doc. RNDr. Zbyněk Kubáček, CSc., Mgr. Serhii Dylda, Mgr. Tomáš Rusin, PhD., Mgr. Iryna Zabaikina, PhD.

Last change: 24.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/1-INF-150/22	Mathematical Analysis (2)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 2 **per level/semester:** 39 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites: FMFI.KMANM/1-INF-110/22 - Mathematical Analysis (1)

Course requirements:
For the semester, the student can get 15 points for exercises, 40 points for written exams, the final written exam has a weight of 30 points, the final oral exam weighs 15 points. The student must obtain at least 45 points from the exercises, written exams and the final written exam, at least 15 points from the final written exam and at least 5 points from the final oral exam. Grading: A (91-100 points), B (81-90 points), C (71-80 points), D (61-70 points), E (51-60 points), Fx (0-50 points).
Weight of the ongoing / final assessment: ongoing assessment 55% (15% exercise + 40% written exams) / 45% (30% final written exam, 15% final oral exam).
Scale of assessment (preliminary/final): 55/45

Learning outcomes:
After completing the course, students will be able to use the apparatus of integral calculus of functions of one real variable, series and series of functions to solve appropriate computational and theoretical problems.

Class syllabus:
Antiderivatives and indefinite integrals and techniques of integration. The definite integral and its properties. Integral as a limit of integral sums. Derivatives with variable endpoints. The fundamental theorem. Mean value theorems. Applications of the integral. Series of positive terms. Absolutely and conditionally convergent series. Power series. Taylor series.

Recommended literature:
Rudin, Walter: Principles of mathematical analysis, ISBN 0-07-054235-X
Hildebrandt, Stefan: Analysis I, ISBN 3-540-42838-0
Forstter, Otto: Analysis I, ISBN 3-528-57224-8
Neubrunn, Tibor a Vencko, Jozef: Mathematical Analysis I, textbook of FMFI UK
Kubáček, Valášek: Cvičenia z Matematickej analýzy 1,2, textbook of FMFI UK

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 641					
A	B	C	D	E	FX
14,82	11,39	13,57	23,4	29,33	7,49
Lecturers: doc. RNDr. Zbyněk Kubáček, CSc., Mgr. Zuzana Šinská, Dr. Hana Šmitala Mizerová					
Last change: 24.06.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/1-MAT-210/22	Mathematical Analysis (3)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 2 **per level/semester:** 52 / 26
Form of the course: on-site learning

Number of credits: 8

Recommended semester: 7.

Educational level: I., II.

Prerequisites: (FMFI.KMANM/1-MAT-150/00 - Mathematical Analysis (2) and (FMFI.KAG/1-MMN-160/22 - Linear Algebra and Geometry (2) or FMFI.KAG/1-MAT-160/15 - Linear Algebra and Geometry (2))) or FMFI.KMANM/1-INF-150/22 - Mathematical Analysis (2) or FMFI.KMANM/1-MMN-150/15 - Mathematical Analysis (2) or FMFI.KMANM/1-INF-150/00 - Mathematical Analysis (2)

Course requirements:
For the semester, the student can get 20 points for exercises, 30 points for written exams, the final written exam has a weight of 30 points, the final oral exam weighs 20 points. The student must obtain at least 40 points from the exercises, written exams and the final written exam, at least 15 points from the final written exam and at least 10 points from the final oral exam. Grading: A (91-100 points), B (81-90 points), C (71-80 points), D (61-70 points), E (51-60 points), Fx (0-50 points).
Weight of the ongoing / final assessment: ongoing assessment 50% (20% exercise + 30% written exams) / 50% (30% final written exam, 20% final oral exam).
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Absolvent of the subject has basic knowledge of metric spaces and differential calculus of scalar and vector functions of several variables and is capable of applying it for solving particular tasks in differential calculus of functions of several variables.

Class syllabus:
1. Metric spaces
n-dimensional Euclidean space Rn, convergence and Cauchy sequence in Rn, metric spaces, convergence in a metric space, complete metric space, normed space, Banach space, Banach fixed point theorem, topology of metric spaces, compact and convex sets, convex functions
2. Limit and continuity
limit and continuity in metric spaces, continuous vector functions, continuity and compactness
3. Differential calculus of functions of several variables
partial derivatives, gradient, total differential and differentiability, derivative of a compound function, directional derivative, Taylor theorem and local extrema

4. Implicitly given functions
implicit function theorem, constrained extrema, Lagrange multipliers

Recommended literature:
J. Filo, K. Rostás: 2^2 × 13 prednášok z matematickej analýzy, Vydavateľstvo UK, 2016.
W. Walter: Analysis 2. Springer, Berlin, 2002.
W. Rudin: Principles of mathematical analysis. McGraw-Hill, Singapore, 1976.
B. P. Demidovich: Problems in Mathematical Analysis, Beekman Books, 1975.
I. Kluvánek, L. Mišík, M. Švec: Matematika 1. SVTL, Bratislava, 1966.
W. Fleming: Functions of Several Variables, Springer-Verlag, New York-Heidelberg-Berlin 1997.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 805

A	B	C	D	E	FX
9,81	9,44	14,53	21,99	29,81	14,41

Lecturers: doc. RNDr. Zbyněk Kubáček, CSc., RNDr. František Jaroš, PhD., RNDr. Kristína Rostás, PhD.

Last change: 24.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-615/10	Mathematical Propedeutics (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
homework
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
better grasp of high-school mathematics, understanding of proof methods and common practices used in mathematics, improved problem-solving skills in various mathematical domains, higher-level overview of mathematics

Class syllabus:
revision of high-school mathematics, explanation of proof methods; discussions and problem-solving in the areas of discrete mathematics, combinatorics, graph theory, algebra, calculus depending on specific demands of the students

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 326

A	B	C	D	E	FX
55,21	8,59	8,28	5,52	6,75	15,64

Lecturers: doc. RNDr. Ján Mazák, PhD.

Last change: 07.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-616/14	Mathematical Propedeutics (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
homeworks
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
understanding of proof methods and common practices used in mathematics, improved problem-solving skills in various mathematical domains

Class syllabus:
additional explanations, discussions and problem-solving in the areas of discrete mathematics, combinatorics, graph theory, algebra, calculus

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 157

A	B	C	D	E	FX
49,04	10,19	3,82	12,1	10,19	14,65

Lecturers: doc. RNDr. Ján Mazák, PhD.

Last change: 07.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KI/1-INF-951/22	**Course title:** Mathematics
Number of credits: 2	
Educational level: I.	
Course requirements: State oral exam	
Learning outcomes: State exam for completing the bachelor degree requirements in the Computer Science program.	
Class syllabus: Mathematical analysis, algebra, discrete mathematics, mathematical logic, graph theory and combinatorics	
State exam syllabus:	
Last change: 14.03.2022	
Approved by: doc. RNDr. Dana Pardubská, CSc.	

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KI/1-BIN-301/15	Methods in Bioinformatics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
Homework assignments (30%), group project (10%), weekly quizzes (10%), written exam (50%). Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be familiar with basic problems and methods in bioinformatics; they will be able to choose an appropriate method for a given biological problem and to interpret its results.

Class syllabus:
Basic concepts from molecular biology, algorithms and machine learning. Sequencing and assembling genomes. Gene finding. Sequence alignment. Evolutionary models and phylogenetic trees. Comparative and population genomics. RNA structure. Motif finding and gene expression analysis. Protein structure and function. Selected current topics.
Students of computer science programs will focus on computer science methods and mathematical modeling of the covered problems.

Recommended literature:
Biological sequence analysis : Probabilistic models of proteins and nucleic acids / Richard Durbin ... [et al.]. Cambridge : Cambridge University Press, 1998
Understanding bioinformatics / Marketa Zvelebil, Jeremy O. Baum. New York : Garland Science, 2008

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 221

A	B	C	D	E	FX
27,6	17,19	21,27	16,74	8,14	9,05

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Askar Gafurov, PhD.
Last change: 14.01.2025
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-MAT-570/15	Modelling and Rendering Techniques

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KAI/1-MAT-570/00

Course requirements:
Continuous assessment: homework, individual work
Examination: written, oral
Indicative assessment scale: A 92%, B 84%, C 76%, D 68%, E 60%
For the semester, the student can get 50% for exercises, 30% for homework, the final written exam has a weight of 20% and the oral exam is voluntary for 20%. The student must solve at least 30% of each homework in order to pass the final written exam. Grading: 92-100 A, 84-91 B, 76-83 C, 68-75 D, 60-67 E. Details on the subject page.
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
It acquaints students with the basic principles of geometric modeling, especially modeling of rigid teties, with the possibilities of local modifications of bodies and global operations on bodies represented by common techniques. Students will deepen their knowledge of rendering techniques.

Class syllabus:
The concept of geometric, quantitative and organizational model. Hierarchy in geometric models. Tools for defining objects, modifying them and storing them. Primitive (basic) objects and their most well-known characteristics. Local modifications and global operations with solids. CSG representation of objects (standard CSG primitives, regularized Boolean operations, identity transformations). Algorithm for construction of CSG - objects. Boundary representations of bodies (B - rep). Euler - Poincare formula and its meaning. Platonic bodies. Euler's operators. Boolean operations at border representations. Wall, edge and top representations of polyhedrons with non-variety surface. Solid modeling with polygonal meshes. Body modeling by sweeping methodology (extruded solids). Rendering techniques for shaded and color images. Object description-based rendering using implicit functions and CSG description. Basic principles of voxel rendering, image - oriented rendering and photo - modeling. Rendering of polygonal meshes. Rendering based on object or image redistribution techniques.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 56

A	B	C	D	E	FX
23,21	39,29	8,93	10,71	8,93	8,93

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-INF-311/00	New Trends in Personal Computers

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:
Final exam: oral
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
By completing the course, the student will gain a basic overview of the functionality of professional computer systems and the possibility of their administration

Class syllabus:
Detailed familiarization with the individual hardware components should allow, in addition to suggestions for optimal configurations, also diagnostics and, if necessary, troubleshooting. The presentation of current technologies in this area should broaden the audience's horizons about the direction of development in the near future. Practical demonstrations will be presented at the faculty FMPHI grid cluster. New knowledge in these areas should help students to better understand the use of new technologies in practice. Due to the rapid development of hardware, the content of the course will be continuously updated.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 94

A	B	C	D	E	FX
58,51	24,47	11,7	4,26	0,0	1,06

Lecturers: doc. Mgr. Róbert Breier, PhD., doc. RNDr. Tibor Ženiš, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-171/15	Operating Systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 39 / 13
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 6.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI/1-INF-171/10

Course requirements:
Work during semester: homeworks
Final exam: both written and oral
Approximate grading scale: A 94%, B 85%, C 75%, D 66%, E 60%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
The student will gain a knowledge necessary to understand structure of the operating system, services it provides and classic algorithms used by the operating system for the management of various types of resources.

Class syllabus:
Concept and structure of the OS: abstraction of resources, system calls, the kernel, drivers.
Processes and interprocess communication: hierarchy of processes, threads, creation, preemption, context switch, the state and life cycle of a process, virtual memory map. Process synchronisation: race conditions, critical section, mutual exclusion and its correct solution, typical problems in process synchronisation, synchronisation mechanisms (semaphores, locks), busy waiting. Deadlock: necessary conditions of deadlock, methods for solving deadlock problems. Management of processes and processors: scheduler types and functions. Memory management: its functions, approaches to managing memory, virtual memory, page fault and the handler, page replacement algorithms, LRU, demand paging, working set model, implementation details and problems. File system: its functions, VFS layer (Virtual file system), file types, hierarchy of directories, management of free disk space, management of allocated space, shared files. I/O device management: I/O device types, allocating I/O,management of disk requests.

Recommended literature:
Tanenbaum, A. S., Woodhull, A. S.: Operating Systems: Design And Implementation (The MINIX book), Third Edition, Pearson, 2009, ISBN-13: 978-0-13-505376-8
Tanenbaum, A. S., Bos, H.: Modern Operating Systems, Fourth Edition, Pearson, 2015, ISBN-13: 978-013-359162-0

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 454

A	B	C	D	E	FX
16,96	14,32	23,35	16,52	11,67	17,18

Lecturers: Ing. Dušan Bernát, PhD., doc. RNDr. Ján Mazák, PhD.

Last change: 07.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-MXX-132/23	Participation in Empirical Research

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2., 4., 6.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 201

A	B	C	D	E	FX
89,55	1,49	1,49	0,0	2,99	4,48

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-MXX-132/23	Participation in Empirical Research

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3., 5.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 201

A	B	C	D	E	FX
89,55	1,49	1,49	0,0	2,99	4,48

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-110/00	Physical Education and Sport (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 0

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Orientation in the history of the selected sports discipline, mastering the basic principles of compensation of mostly mental burdens of the individual. Creating a positive, lasting relationship to physical education and sports in the sense of calocagation. Mastering the demands for the development of motor abilities, skills, proper technique of performing individual movements in individual sports, individual game activities in collective sports games.

Class syllabus:
Introduction to the basic history of the selected sport, with the basic principles of compensation of one-sided psychological burden of the individual's body. Development of basic motor skills with a stop to all kinds of endurance, coordination, increasing the level of joint mobility. Training of individual game activities in collective sports games. In individual sports disciplines, practice of basic techniques of individual elements.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 7053

A	B	C	D	E	FX
93,31	1,6	0,21	0,0	0,07	4,81

Lecturers: Mgr. Ladislav Mókus, PaedDr. Dana Mašlejová, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký

Last change: 16.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-120/22	Physical Education and Sport (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Addressing a positive and lasting relationship with physical education and sport by understanding the importance of physical development and maintaining its optimal level throughout life. The use of strength and other motor skills to more rationally manage the game activities of the individual, while improving the acquisition of more complex elements of technology. In everyday life in providing basic necessities.

Class syllabus:
Completing a positive lasting relationship to physical education and sport. Development of motor skills with a focus on the development of strength, with an emphasis on dynamic strength and endurance in strength. In collective sports games, improving individual game activities, practicing basic game combinations, playing with modified rules, tasked games. In individual sports disciplines, the development of motor abilities and skills necessary for the acquisition of more complex elements of lower difficulty techniques.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 5840

A	B	C	D	E	FX
95,6	1,51	0,14	0,09	0,05	2,62

Lecturers: Mgr. Tomáš Kuchár, PhD., PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký
Last change: 15.03.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-210/00	Physical Education and Sport (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
To practise game combinations, tactical - mechanical elements in basketball, volleyball, soccer, floorball, ice hockey, badminton, competition rules in the sports specialization.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 3268

A	B	C	D	E	FX
98,29	0,46	0,09	0,03	0,0	1,13

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký

Last change: 16.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-220/00	Physical Education and Sport (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Preparation for sport championships of the Faculty in the chosen sport at modified rules. The selection of talented students into the teams of the University and Faculty leagues and other faculty sport events.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2956

A	B	C	D	E	FX
97,94	0,17	0,1	0,03	0,0	1,76

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-310/00	Physical Education and Sport (5)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Preparation and participation of individuals and teams in the system of university sport competitions and sport events.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2172

A	B	C	D	E	FX
98,66	0,37	0,09	0,0	0,0	0,87

Lecturers: Mgr. Tomáš Kuchár, PhD., Mgr. Ladislav Mókus, Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-320/22	Physical Education and Sport (6)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 6.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KTV/1-MXX-320/00

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
Using the communication in the physical education and sport and organizing the sport championships to achieve expressive motion of the sport and health in a valuable orientation the students.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 204

A	B	C	D	E	FX
94,61	0,49	0,49	0,0	0,0	4,41

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký

Last change: 15.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-270/15	Practicum in Databases

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5., 7.

Educational level: I.

Prerequisites:

Course requirements:
homework
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%

Learning outcomes:
Practical experience with Datalog and SQL queries in relational databases; overview of related technologies; introduction to database design, optimization and administration.

Class syllabus:
Writing and debugging database queries. Design of a relational database: tables, constraints, foreign keys, indexes. Importing, exporting and updating data via command-line tools and from programs in common languages. Basic optimisation. Access rights.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 231

A	B	C	D	E	FX
57,14	9,96	5,19	11,26	5,19	11,26

Lecturers: doc. RNDr. Ján Mazák, PhD., RNDr. Michal Rjaško, PhD.

Last change: 07.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-315/14	Principles of Reverse Engineering

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-526 (or similar course about assembler programming on x86 architectures), 1-INF-127 (or similar course about C/C++ programming)

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Completing the course the student will gain basic knowledge about reverse engineering techniques and their application in practice in the analysis of software functionality.

Class syllabus:
Basic principles and tools - disassembling, debugging, decompilation virtualization; Reverse engineering on Window platform - Portable Executable format, Windows API; Anti-debugging tricks: run-time compression, obfuscations; RE of Java and .NET applications; RE on Android, Mac, and Linux platforms; basics of secure programming - security vulnerabilities, exploits

Recommended literature:
Dennis Yurichev: Reverse engineering for beginners (online: http://beginners.re/RE_for_beginners-en.pdf)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 81

A	B	C	D	E	FX
45,68	12,35	14,81	3,7	6,17	17,28

Lecturers: Ing. Róbert Lipovský

Last change: 14.03.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-517/22	Principles of Software Design (1)

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
During semester: homeworks (60 points).
Examination period: oral examination from a set of announced topics (60 bodov).
Grading scale: A: more than 110pts, B: more than 100pts, C: more than 90pts, D: more than 80pts, E: more than 72pts. Student has to get at least 20pts from homeworks.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will get an overwiew of modern trends in software development; they can distinguish good and bad practices in programming and project management.

Class syllabus:
Software development methodologies, agile, lean, configuration management, git, requirements, object design, SOLID, dependency injection, UML, quality assurance, testing, refactoring, continuous integration

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 182

A	B	C	D	E	FX
25,82	14,84	14,84	18,68	9,89	15,93

Lecturers: doc. RNDr. Robert Lukoťka, PhD.

Last change: 07.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-518/22	Principles of Software Design (2)

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:
During semester: homeworks (60 points).
Examination period: oral examination from a set of announced topics (60 bodov).
Grading scale: A: more than 110pts, B: more than 100pts, C: more than 90pts, D: more than 80pts, E: more than 72pts. Student has to get at least 20pts from homeworks.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students extends their overwiew of modern trends in software development; they can distinguish good and bad practices.

Class syllabus:
Programming paradigms, type checking, good practices handling concurrency and parallelism (immutable data structures, futures and promises, introduction to asynchronous programming), databases – types and guarantees, architecture, architectural styles and patterns, stateless services, documentation and maintanence, management of SW projects, SCRUM, estimations, lean startup.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 65

A	B	C	D	E	FX
20,0	23,08	21,54	16,92	9,23	9,23

Lecturers: doc. RNDr. Robert Lukoťka, PhD., RNDr. Jana Kostičová, PhD.

Last change: 03.02.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-127/15	Programming (1) in C/C++

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 4 / 4 **per level/semester:** 52 / 52
Form of the course: on-site learning

Number of credits: 8

Recommended semester: 3.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KI/1-INF-127/11

Course requirements:
During semester: tasks from practicals (25%), homeworks (15%), test (30%).
Final practical exam (30%). Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website.
Scale of assessment (preliminary/final): 70/30

Learning outcomes:
Students will be able to write short programs in C/C++ language, debug them and understand existing code. They will be familiar with basic control and data structure constructs of the language, as well as simple dynamic data types and algorithms operating on them.

Class syllabus:
Basic control and data structure constructs of the language (loops, conditionals, variables and their types, functions and their parameters, arrays, pointers, strings, files). Basic algorithms and data structures (sorting, linked lists, hash tables, trees, arithmetic expressions, stack and queue, recursion, filling connected areas).

Recommended literature:
Algorithms in C : Parts 1-4 : Fundamentals, data structures, sorting, searching / Robert Sedgewick. Boston : Addison-Wesley, 1998
Programming in C / Stephen G. Kochan. Indianapolis : SAMS Publishing, 2005
Algoritmy v jazyku C a C++ : Praktický průvodce / Jiří Prokop. Praha : Grada, 2009
Custom electronic materials published at the course website http://compbio.fmph.uniba.sk/vyuka/prog/

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 750

A	B	C	D	E	FX
26,67	14,53	12,0	13,47	7,2	26,13

Lecturers: doc. Mgr. Bronislava Brejová, PhD., Ing. Dušan Bernát, PhD., RNDr. Jana Kostičová, PhD.

Last change: 27.10.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-166/11	Programming (2) in Java

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites: FMFI.KI/1-INF-127/15 - Programming (1) in C/C++

Antirequisites: FMFI.KAI/1-AIN-170/00

Course requirements:
Assignments: practical tests (40% of overall evaluation), homework (30% of overall evaluation).
Exam: written, practical, and oral part (30% of overall evaluation).
Grading scale: A 95%, B 90%, C 80%, D 70%, E 60%
Scale of assessment (preliminary/final): 70/30

Learning outcomes:
Students will master the basics of object-oriented programming in Java, as well as the creation of simple graphical user interfaces. They will get acquainted with selected basic graph algorithms and manage their implementation in Java.

Class syllabus:
A.) OBJECT-ORIENTED PROGRAMMING IN JAVA
Basics of the Java language for C/C++ programmers. Object-oriented programming basics, inheritance, polymorphism. Exceptions. Generic programming, Java Collections, iterator, comparator. Local and anonymous classes, lambda expressions.
B.) GRAPH ALGORITHMS
Representation of directed and undirected graphs in computer memory, depth-first and breadth-first search, topological sorting of directed acyclic graphs, backtracking approach to solving graph problems (e.g., the maximum clique problem).
C.) CREATION OF APPLICATIONS WITH GRAPHICAL USER INTERFACE
Creation of simple graphical user interfaces using a suitable library (e.g., JavaFX), event-driven programming.

Recommended literature:
Electronic materials and links at the course website.
Algorithms in Java, 3rd ed., Part 5: Graph algorithms / Robert Sedgewick. Boston : Addison-Wesley, 2003
Thinking in Java, 4th ed. / Bruce Eckel. Upper Saddle River : Prentice-Hall, 2006 Java SE 8 for the Really Impatient / Cay S. Horstmann. Upper Saddle River : Addison-Wesley, 2014

Grafy a jejich aplikace / Jiří Demel. Prague : Academia, 2002

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 728

A	B	C	D	E	FX
43,96	10,16	12,23	11,13	11,13	11,4

Lecturers: RNDr. Peter Kostolányi, PhD., doc. Mgr. Bronislava Brejová, PhD., doc. RNDr. Ján Mazák, PhD., Mgr. Matúš Matok

Last change: 27.10.2023

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-225/15	Programming (3)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 5.

Educational level: I.

Prerequisites: FMFI.KI/1-INF-127/15 - Programming (1) in C/C++ and FMFI.KI/1-INF-166/11 - Programming (2) in Java

Course requirements:
midsemester test, homeworks, final practical exam
Assessment (approx.): A 94%, B 88%, C 75%, D 69%, E 63%
More detailed information is available on the website.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be able to use advanced constructs of Java programming language, design appropriate implementation of common situations in class and interface design, improve existing objectoriented code.

Class syllabus:
Advanced constructs of Java programming language (generics and bounded quantification, inner classes, lambda expressions,garbage collection, threads and their life cycle, thread synchronisation).
Design patterns (Singleton, Composite, Strategy, Decorator, Iterator, Visitor, ...);

Recommended literature:
Erich Gamma ... [et al.]. Design Patterns: Elements of Reusable Object-Oriented Software. Addison-Wesley, 1994, ISBN-13: 978-0201633610.
Eric Freeman, Elisabeth Robson. Head First Design Patterns: Building Extensible and Maintainable Object-Oriented Software. O'Reilly Media, 2020, ISBN-13: 978-1492078005.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 292

A	B	C	D	E	FX
26,71	14,38	16,44	16,44	20,55	5,48

Lecturers: RNDr. Richard Ostertág, PhD., doc. RNDr. Robert Lukoťka, PhD., Mgr. Matúš Matok
Last change: 28.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-184/15	Programming Languages

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-INF-225 Programming (3)

Course requirements:
Midsemester test, endsemester homework.
Written practical programming exam and theoretical oral exam.
Assessment (approx.): A 92%, B 84%, C 76%, D 68%, E 60%.
More detailed information is available on the website.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be able to faster learn a new programming language, because the course will familiarize them with basic programming paradigms, language constructs and theoretical concepts underlying programming languages.

Class syllabus:
Of the programming paradigms, the lecture deals mainly with functional programming (imperative, object-oriented and declarative programming student already knows from other subjects). Among language constructions and concepts, we will mention pattern mathing, closures, lazy evaluation, pure functions, type classes, algebraic data types, recursion schemes, functors, monads, macro-hygiene, static and dynamic typing and more. These topics will be illustrated mainly in the Haskell and the Racket programming languages.

Recommended literature:
Simon Thompson. Haskell: The Craft of Functional Programming. Addison-Wesley Professional, 2011, ISBN-13: 978-0201882957.
Miran Lipovaca. Learn You a Haskell for Great Good!: A Beginner's Guide. No Starch Press, 2011, ISBN-13: 978-1593272838.
Bartosz Milewski. Category Theory for Programmers. 2019, ISBN-13: 978-0464243878.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 138

A	B	C	D	E	FX
41,3	9,42	19,57	12,32	5,8	11,59

Lecturers: RNDr. Richard Ostertág, PhD., doc. Mgr. Bronislava Brejová, PhD., Mgr. Matúš Matok

Last change: 28.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-235/22	Project (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Final evaluation
The evaluation is governed by the education quality system of Comenius University.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain practical experience usable in working on a bachelor's thesis, e.g. creates a software product, acquires skills in working with abstract theory, etc

Class syllabus:
The student, under the guidance of the supervisor, works independently on the assigned task. Part of the direct output of the project is a written report in which the student presents the progress and results of their work during the semester.

Recommended literature:

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 556

A	B	C	D	E	FX
72,12	8,81	5,4	2,88	3,96	6,83

Lecturers: doc. Mgr. Tomáš Plachetka, Dr.

Last change: 23.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-265/22	Project (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KI/1-INF-235/22 - Project (1)

Course requirements:
Final evaluation
The evaluation is governed by the education quality system of Comenius University.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain practical experience usable in working on a bachelor's thesis, e.g. creates a software product, acquires skills in working with abstract theory, etc.

Class syllabus:
The student, under the guidance of the supervisor, works independently on the assigned task. Part of the direct output of the project is a written report in which the student presents the progress and results of their work during the semester.

Recommended literature:

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 541

A	B	C	D	E	FX
56,38	11,83	10,54	6,1	5,18	9,98

Lecturers: doc. Mgr. Tomáš Plachetka, Dr.

Last change: 23.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-173/13	Quantum Information Processing

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
ongoing evaluation: exam
estimated grading curve: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The students get acquainted with the basics of the quantum information theory.

Class syllabus:
1. Introduction and history
2. Pure quantum state and superposition principle
3. Quantum measurement and uncertainty relations
4. Mixed quantum states
5. Time evolution of quantum systems
6. Two quantum systems - EPR paradox
7. Bell inequalities
8. Quantum information
9. Basic quantum protocols
10. Experimental realization and decoherence
11. Indistinguishability principle and elementary particles

Recommended literature:
John Preskill: Lecture Notes on Quantum Information,
http://www.theory.caltech.edu/people/preskill/ph229/#lecture
M. A. Nielsen and I. L. Chuang: Quantum computation and Quantum Information, Cambridge university press (2000)

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 60					
A	B	C	D	E	FX
48,33	15,0	15,0	13,33	8,33	0,0
Lecturers: doc. RNDr. Martin Plesch, PhD.					
Last change: 14.03.2022					
Approved by: doc. RNDr. Dana Pardubská, CSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-161/00	Russian Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
To master the fundamentals of general Russian. The language level is A1.
Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts.
The subject provides a course in Russian language for beginners.

Recommended literature:
The textbook: : Точка Ру A1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 738

A	B	C	D	E	FX
57,86	16,53	10,98	4,2	1,76	8,67

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-162/00	Russian Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
To master the fundamentals of general Russian.
Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts.
The subject continues the program of Russian language (1) and provides a course of Russian for beginners.

Recommended literature:
Textbook: Точка Ру A1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 435

A	B	C	D	E	FX
63,91	16,09	8,97	3,91	0,92	6,21

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-261/00	Russian Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
Точка Ру A2 (Ольга Долматова, Екатерина Новачац) a Short Stories in Russian (Olly Richards, Alex Rowlings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 212

A	B	C	D	E	FX
69,34	17,92	8,96	2,36	0,0	1,42

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-262/00	Russian Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.

Class syllabus:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
Точка Ру A2 (Ольга Долматова, Екатерина Новачац) a Short Stories in Russian (Olly Richards, Alex Rowlings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 153

A	B	C	D	E	FX
74,51	14,38	7,19	2,61	0,65	0,65

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-IKVa-192/19	Science, Technology and Humanity: Opportunities and Risks

Educational activities:
Type of activities: seminar
Number of hours:
per week: 3 **per level/semester:** 39
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: I., I.II., II.

Prerequisites:

Course requirements:
Semestral evaluation: active participation
Final evaluation: essay
Weight of the final evaluation: 60%
To achieve an A, 90% is needed, for B at least 80%, for C 70%, for D, 60% and for an E, at least 50% of overall assessment.

Learning outcomes:
The students will gain awareness of the contemporary and potential future challenges posed by scientific and technological innovations and their impact on human behaviour, culture and society.

Class syllabus:
Big data: privacy, politics and power,
Internet of things, it usefulness and threats,
Assistant AI and its place in future society,
Job market and inequality,
Enhancements and human rights and the right to change self and others,
Initiatives for responsible research,
Artificial minds,
Hybridization between species and between AI and organic minds,
Future of minds and trans-humanism,
Artificial emotional intelligence,
An after human era.

Recommended literature:
- S. Russell: Human compatible. Artificial intelligence and the problem of control. Viking, 2019.
- J. Havens: Heartificial intelligence. Embracing our humanity to maximize machines. Penguin, 2016.
- P. Boddington: Towards a code of ethics for artificial intelligence. Springer, 2017.
- M. Shanahan: The technological singularity. MIT Press, 2015.

- C. MacKellar, C.: Cyborg Mind: What Brain–Computer and Mind–Cyberspace Interfaces Mean for Cyberneuroethics. Berghahn Books, 2019.
- G. Bel, J. Gemmell: Total Recall, How the e-Memory Revolution will change everything. Dutton, 2009.
- S. Zuboff: The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. PublicAffairs, 2019.
- C. O'Neil: Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy. Crown Publishers, 2016.
- M. Tegmark: Life 3.0. Allen Lane, 2017.

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 146

A	B	C	D	E	FX
40,41	21,92	16,44	6,85	4,79	9,59

Lecturers: doc. RNDr. Martin Takáč, PhD., PhDr. Ing. Tomáš Gál, PhD.

Last change: 28.02.2020

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-317/22	Security Testing

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 26 / 13
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 8.

Educational level: I.

Prerequisites:

Course requirements:
Homework assignments, final written exam
Weight of the course work / exam: 50/50
Grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will know the methods and procedures for security testing. They will gain practical experience with selected vulnerability detection techniques.

Class syllabus:
objectives, types and methodologies of security testing, threat modeling, passive and active reconnaissance, vulnerability detection, exploitation of vulnerabilities, compliance and configuration audit, standards, social engineering and the human factor

Recommended literature:
Peter Kim: The Hacker Playbook 3: Practical Guide To Penetration Testing, Secure Planet, 2018
Georgia Weidman: Penetration Testing: A Hands-On Introduction to Hacking,‎ No Starch Press, 2014
OWASP Web Security Testing Guide (https://owasp.org/)
Ďalšie on-line zdroje

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 18

A	B	C	D	E	FX
33,33	38,89	11,11	5,56	0,0	11,11

Lecturers: doc. RNDr. Martin Stanek, PhD.

Last change: 21.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-130/00	Service Oriented Architectures - Principles and Technologies

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
ongoing evaluation: project, exam
estimated grading curve: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
introduction to the service-oriented technologies

Class syllabus:
1. General introduction to service-oriented architectures
2. Business process modeling and its software aspects
3. Integration middleware and related standards (CORBA, DCOM, .Net, J2EE, ...)
4. Business to Business (B2B) integration tools
5. Web services and their advanced aspects (orchestration, semantics capture)
6. Enterprise Service Bus - containers, services, processes, communication
7. Use of specific tools in the field of service-oriented architectures

Recommended literature:
CHAPPELL, D. Enterprise Service Bus. Oâ€™Reilly, 2004., KRAFZIG, D., BANKE, K., SLAMA, D. Enterprise SOA. Prentice Hall, 2005., MARKS, E., BELL M. Service-Oriented Architecture. New Jersey: John Wiley & Sons, Inc., 2006

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 79

A	B	C	D	E	FX
40,51	22,78	21,52	6,33	5,06	3,8

Lecturers: Dr. Josef Withalm, Mgr. Pavol Mederly

Last change: 14.03.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-171/20	Slovak Language for Foreign Students (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II., II., III.

Prerequisites:

Course requirements:
tests
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.

Class syllabus:
The sylabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1).

Recommended literature:
Krížom- Krážom Slovenčina 1, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 113

A	ABS	B	C	D	E	FX	NEABS
32,74	23,89	8,85	6,19	0,88	0,0	24,78	2,65

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-172/20	Slovak Language for Foreign Students (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II., II., III.

Prerequisites:

Course requirements:
tests
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.

Class syllabus:
The sylabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1) and this course is a follow up course to the Slovak language course 1.

Recommended literature:
Krížom- Krážom Slovenčina 1, additional material to further support the covered topics

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 86

A	ABS	B	C	D	E	FX	NEABS
62,79	18,6	1,16	1,16	0,0	0,0	9,3	6,98

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-271/20	Slovak Language for Foreign Students (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II., II., III.

Prerequisites:

Course requirements:
tests
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.

Class syllabus:
The sylabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 2.

Recommended literature:
Krížom-Krážom Slovenčina 2, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 32

A	ABS	B	C	D	E	FX	NEABS
59,38	3,13	18,75	3,13	3,13	0,0	12,5	0,0

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-272/20	Slovak Language for Foreign Students (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II., II., III.

Prerequisites:

Course requirements:
tests
Course prerequisites:
https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.

Class syllabus:
The sylabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 3.

Recommended literature:
Krížom-Krážom Slovenčina 2, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 25

A	ABS	B	C	D	E	FX	NEABS
84,0	0,0	4,0	4,0	0,0	0,0	8,0	0,0

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-INF-175/00	Social Aspects of Informatics

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 6.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KDMFI/1-UXX-332/22

Course requirements:
Three essays submittied during the semester, each for 15 points. Grades: A 41-45 points, B 36-40, C 31-35, D 26-30, E 21-25.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be motivated to think about the impact of information and communication technologies on our lives. Students will be familiar with historical perspective of this impact.

Class syllabus:
New ICT are developed and improved very rapidly. They are becoming an invisible part of our everyday life. We try to look at changes introduced by ICT, what positive they are introducing and what the risks are too. We try to analyse different areas of society: education system, medical care, arts, business, finance, manufacturing, etc. Especially we deal with Slovak copyright law and computer crime.

Recommended literature:
Abelson,Ledeen, Lewis, BlownTo Bits, Addison Wesley 2008, www.bitsbook.com
Materials shared at the course website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1914

A	B	C	D	E	FX
70,01	8,31	4,23	10,82	2,87	3,76

Lecturers: doc. RNDr. Daniel Olejár, PhD., RNDr. Michal Winczer, PhD.

Last change: 21.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-115/15	Sports in Nature (1)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%.
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 300

A	B	C	D	E	FX
99,0	0,33	0,33	0,0	0,0	0,33

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký

Last change: 16.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-215/15	Sports in Nature (2)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide sports equipment.

Past grade distribution
Total number of evaluated students: 297

A	B	C	D	E	FX
92,59	0,0	0,0	0,0	0,34	7,07

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-216/18	Sports in Nature (3)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-151/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 55

A	B	C	D	E	FX
98,18	0,0	0,0	0,0	0,0	1,82

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-217/18	Sports in Nature (4)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-152/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide material equipment.

Past grade distribution
Total number of evaluated students: 40

A	B	C	D	E	FX
90,0	0,0	0,0	0,0	0,0	10,0

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-133/18	Supplementary English Course (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 credit - ongoing evaluationMinimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course.A 100-93 %B 92-85 %C 84-77 %D 76-70 %E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form.
Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998
Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 68

A	B	C	D	E	FX
51,47	20,59	7,35	4,41	4,41	11,76

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024
Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-134/18	Supplementary English Course (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 ENcredit - ongoing evaluation Minimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course. A 100-93 % B 92-85 % C 84-77 % D 76-70 % E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form. Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998 Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 72

A	B	C	D	E	FX
54,17	13,89	4,17	8,33	5,56	13,89

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-526/15	System Programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites:

Recommended prerequisites:
The course requires knowledge of the C programming language.

Course requirements:
Project (during semester), written final test (at least 50% needed) and oral final exam (may be waived)
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be familiar with principles and methods of system programming and will have a practical experience with their use.

Class syllabus:
(1) Fundamentals of system programming
data representation, assembler, instruction types, address modes, program structure in GNU as, linking programs, calling conventions, stack manipulation, libraries, loading and executing programs
(2) IA-32 architecture and X86-64 architecture
basic architecture, registers, selected instructions, memory models, virtual memory
(3).Selected system calls of UNIX systems
Starting and temrinating processes, input/output, network communication, terminal, signals

Recommended literature:
Custom course notes published on the course website. Publicly available web resources.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 428

A	B	C	D	E	FX
8,88	9,11	15,89	16,12	29,67	20,33

Lecturers: RNDr. Jaroslav Janáček, PhD., Ing. Dušan Bernát, PhD., doc. RNDr. Robert Lukoťka, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-176/15	Unix for System Administrators

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
Practical assignments (both during the semester and on final exam)
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course the students will know the principles of UNIX system administration and they will be able to practically carry out the basic duties of a system administrator.

Class syllabus:
users, groups, passwords
access permissions for files and directories, ACL
filesystem structure
character and block devices
special filesystem objects (symlink, pipe)
mounting and unmounting of filesystems to the directory hierarchy (mount, umount, /etc/fstab)
creating filesystems
system startup and shutdown - /etc/inittab, runlevels
job scheduling (cron, at, batch)
TCP/IP configuration (ifconfig, route)
network services (/etc/services, /etc/inetd.conf, /etc/protocols, /etc/hosts, ...)
DNS – client (/etc/resolv.conf)
DNS – server
NFS
Firewall
SystemD
Assumptions:
good user-level knowledge of UNIX systems, directory hierarchy navigation, creating and editing files (vi, joe), shell programming (sh/bash), commands find, grep, cat, cut, ls, awk.

Recommended literature:

Course notes provided on the course website, freely available electronic materials

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 273

A	B	C	D	E	FX
15,38	28,94	26,74	14,65	9,52	4,76

Lecturers: RNDr. Jaroslav Janáček, PhD., Ing. Dušan Bernát, PhD., doc. Mgr. Tomáš Plachetka, Dr.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-275/18	Unstructured Talks on Structures: Chapters in Mathematics for Computer Scientists (1)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Course requirements:
homework assignments (30%), oral exam (70%)
Grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will come to a better apprehension of the role of abstract mathematics in (both theoretical and applied) computer science and gain a deeper understanding of some familiar concepts and methods. They will get acquainted with selected branches of mathematics important for their computer science applications, which are not covered as a part of the standard curriculum, or which are only covered marginally.

Class syllabus:
Matrix interpretation of some problems on graphs. Semirings, complete semirings, and matrices over them. Finite automata over semirings. Formal power series and their combinatorial meaning. Formal power series in several non-commutative variables. Weighted automata and their applications. Eigenvalues and eigenvectors, their applications, Jordan canonical form. Eigenvalues of directed graphs, enumeration of walks. The Perron-Frobenius theory of nonnegative matrices. Calculus of finite differences. Solution methods for difference equations and their systems of selected types. Spectral graph theory and its applications in computer science.

Recommended literature:
Electronic materials at the course website.
Grafy a jejich aplikace / Jiří Demel. Prague : Academia, 2002
Handbook of Weighted Automata / Manfred Droste, Werner Kuich, Heiko Vogler (eds.). Heidelberg : Springer, 2009
Lineárna algebra a geometria / Pavol Zlatoš. Bratislava : Albert Marenčin PT, 2011
Linear Algebra Done Right, 3rd ed. / Sheldon Axler. Heidelberg : Springer, 2015
Nonnegative Matrices / Henryk Minc. New York : Wiley, 1988
An Introduction to Difference Equations, 3rd ed. / Saber Elaydi. New York : Springer, 2005

Algebraic Graph Theory / Chris Godsil, Gordon Royle. New York : Springer, 2001
A First Course in Network Theory / Ernesto Estrada, Philip Knight. Oxford : Oxford University Press, 2015
An Introduction to the Theory of Graph Spectra / Dragoš Cvetković, Peter Rowlinson, Slobodan Simić. Cambridge : Cambridge University Press, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 19

A	B	C	D	E	FX
68,42	0,0	0,0	10,53	0,0	21,05

Lecturers: RNDr. Peter Kostolányi, PhD., doc. RNDr. Edita Mačajová, PhD.

Last change: 15.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-276/18	Unstructured Talks on Structures: Chapters in Mathematics for Computer Scientists (2)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 8.

Educational level: I., II.

Prerequisites:

Course requirements:
homework assignments (30%), oral exam (70%)
Grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will gain familiarity with some more advanced branches of mathematics in connection to their computer science applications.

Class syllabus:
Metric spaces, the Banach fixed point theorem and its applications. Basic notions of universal algebra, varieties of algebras, Birkhoff's variety theorem. Pseudovarieties of finite algebras, Reiterman's theorem. Recognition of formal languages by monoids and semigroups, syntactic monoids and syntactic semigroups, the Myhill-Nerode theorem. Basics of the structural theory of general and finite semigroups based on Green's relations. Varieties of formal languages and their connection to pseudovarieties of finite monoids and semigroups via the Eilenberg correspondence. Algebraic theory of recognisable languages.

Recommended literature:
Electronic materials and links at the course website.
Introduction to Topology and Modern Analysis / George F. Simmons. New York : McGraw-Hill, 1963
Matematická analýza II / Jiří Brabec, Bohuslav Hrůza. Prague : SNTL, 1986
Universal Algebra / P. M. Cohn. Dordrecht : D. Reidel Publishing Company, 1981
Finite Semigroups and Universal Algebra / Jorge Almeida. Singapore : World Scientific, 1994
Elements of Automata Theory / Jacques Sakarovitch. Cambridge : Cambridge University Press, 2009
Fundamentals of Semigroup Theory / John M. Howie. Oxford : Clarendon Press, 1995
Automata and Languages / John M. Howie. Oxford : Clarendon Press, 1991
Varieties of Formal Languages / J. E. Pin. London : North Oxford Academic Publishers, 1986

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 5

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Peter Kostolányi, PhD., doc. RNDr. Edita Mačajová, PhD.

Last change: 15.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-AIN-189/22	Web Applications (1)

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites:

Recommended prerequisites:
1-AIN-112 Introduction to web technologies

Antirequisites: FMFI.KZVI/1-AIN-615/00

Course requirements:
Intermediate assessment: practical assignments, project (max 20%)
Exam: practical (at least 70% of the semester points are needed)
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
After completing the course, students will be able to create a simple server-side web application with personalized access to individual parts of the application. The data will be stored in a database.

Class syllabus:
- Server-side web applications
- Introduction to PHP
- Basic language structures (1)
- Variables, constants, strings, operators, conditions, loops
- Basic language structures (2)
- working with date and time, arrays, functions to work with arrays and strings
- Reusing code
- Form processing, input processing and treatment
- SESSION, COOKIES
- Introduction to working with a database
- Basic database queries
- SELECT, INSERT, UPDATE, DELETE
- Linking PHP to the database
- Working with multiple tables at the same time

Recommended literature:
actual documentation for each technology
w3schools.com
own electronic texts published on the website or in the Moodle environment

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1078

A	B	C	D	E	FX
40,17	12,43	10,11	10,67	9,83	16,79

Lecturers: PaedDr. Roman Hrušecký, PhD., RNDr. Marek Nagy, PhD., doc. RNDr. Zuzana Kubincová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KDMFI/2-AIN-111/24	Web Design Methodology

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 26 / 26
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 7.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI.KAI+KDMFI/2-AINa-111/20

Course requirements:
Semester: project 60pts, final test 15pts (minimum 50%)
Exam: oral exam 25pts (admittance requirement: 60pts from the semester)
Passing the course: 50pts altogether and 50% from the final test
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 75/25

Learning outcomes:
An overview of web technologies and their applications for various purposes. Principles and methodologies of web applications, web user interfaces, and web content design.

Class syllabus:
- Overview of web technologies and web architecture
- Information architecture, types of websites, web applications, components and interfaces
- Client platforms (mobile, tablet, desktop) and implications for web design and development
- Methodologies of website and web application development (waterfall model, agile methodologies)
- Interaction design methodologies (user research and modelling, iterative prototype-based design, prototype testing)
- Principles and methodologies of web content curation
- Testing, optimization and maintenance of web applications and web content
- Website and web application quality measures

Recommended literature:
Web Style Guide, 4th ed. / P.J. Lynch, S. Horton. Yale University Press, 2016. Dostupné online: http://webstyleguide.com/
Mobile First. L. Wroblewski, A Book Apart, 2011

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 19

A	B	C	D	E	FX
5,26	5,26	26,32	26,32	21,05	15,79

Lecturers: doc. RNDr. Zuzana Kubincová, PhD., doc. RNDr. Martin Homola, PhD., Mgr. Ján Kľuka, PhD.

Last change: 28.05.2024

Approved by: doc. RNDr. Dana Pardubská, CSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-MAT-560/00	Web Graphics

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 7.

Educational level: I.

Prerequisites:

Course requirements:
For the semester, the student can get 50% for exercises, 20% for midterm and the final written exam has a weight of 30%. The student must obtain at least half of the points for the exercises as well as for the project in order to pass the final written exam.
Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0).
Scale of assessment (preliminary/final): Weight of midterm / final assessment: Mid-term assessment 20% (midterm) / + 50% project 30% final exam.

Learning outcomes:
The course offers knowledge and skills in the dynamically developing field of Internet communication through multimedia objects. Graduates will get acquainted with the rules and methods of effective authoring work and the most modern technologies in accordance with the recommendations of the ACM Computing Curriculum.

Class syllabus:
1. Basic definitions. Historic survey, state-of-the art and the future of WWW. Semantic Web a Digital Libraries. Mobile communication. Security, legal and social aspects. Webby awards.
2. Client-server architecture. Dominant web services and technologies. SGML, HTML, VRML, UML. Java, php, ASP.NET and others. Examples of proper use. MIME formats and RFC standards. WWW Consortium.
3. Text creation, digital typography and DTP. On-line publishing authoring legal aspects.
4. Creation and use of pictorial data for WWW.
5. WWW sound processing and applications.
6. Internet animations and video.
7. WWW virtual interaction. Face demo by Ken Perlin. WWW as a procedural sketch book.
8. Web design styles and rules after A. Glassner.
9. 3D web graphics, VRML a X3D.
10. Virtual galleries, gardens, thematic parks and chat rooms.
11. Social and philosophic aspects of virtual environments. Netiquette. Third wave by A. Toffler. History of virtual reality (Gibson, Krueger, Lanier, CAVE...). Cult movie Matrix and implications of its message.

12. Interakcia, navigácia a kooperácia vo virtuálnych prostrediach. Distribuovaná VR. Hry a simulátory.
13. Spájanie obrazu s textom. Vizuálna kritika web stránok.
14. Virtuálne mestá. Akvizícia, konštrukcia, prezentácia, aplikácie.
15. Groupware. Skupinová komunikácia. Avatari a on-line komunity. MPEG-7 a MPEG-21.

Recommended literature:
CGEMS (web stránka ACM SIGGRAPH, www.siggraph.org).
W3Schools tutorials (HTML, SVG...).
BERNERS-LEE, T. Semantic Web, Scientific American, May 2001.
SIGGRAPH course notes by B. Mitchell, A. Glassner and K. Perlin.
Class materials available from the class web page.

Languages necessary to complete the course:
English, Slovak

Notes:
The class is eventually taught in a distant mode.

Past grade distribution
Total number of evaluated students: 740

A	B	C	D	E	FX
25,54	28,38	21,22	10,54	4,19	10,14

Lecturers: Mgr. Marcel Makovník, PhD., doc. RNDr. Andrej Ferko, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Dana Pardubská, CSc.