Course descriptions

TABLE OF CONTENTS

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-141/22	Algebra and Theoretical Arithmetic (0)

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:
Continuous assessment: Homework
Final assessment: Exam
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx < 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Acquire practical skills to solve tasks involving generalization, mathematize a verbal task, and work with general expressions. The ability to solve tasks from the theory of numbers and different types of equations, inequalities and their systems. Familiarize yourself with complex numbers.

Class syllabus:
Numbers, variables and expressions. Elementary number theory. Equations, inequalities and their systems. Complex numbers.

Recommended literature:
textbooks of Mathematics of lower and upper secondary school
Seminár z matematiky : 1. časť / Zbyněk Kubáček, Ján Žabka Bratislava : Mapa Slovakia Plus s.r.o., 2017
Seminár z matematiky : 2. časť / Zbyněk Kubáček, Ján Žabka Bratislava : Mapa Slovakia Plus s.r.o., 2018
Seminár z matematiky : 3. časť / Zbyněk Kubáček, Ján Žabka Bratislava : Mapa Slovakia Plus s.r.o., 2020

Languages necessary to complete the course:
Slovak, English

Notes:
The course is primarily intended for teacher training students; students of other programs can enroll in it only with the consent of their guarantor.

Past grade distribution
Total number of evaluated students: 85

A	B	C	D	E	FX
47,06	17,65	12,94	5,88	4,71	11,76

Lecturers: Mgr. Emília Miťková, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-112/22	Algebra and Theoretical Arithmetic (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: 2.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary assessment: homework, test.
Final assessment: Exam in written and oral form
Final assessment examination (A 90%, B 80%, C 70%, D 60%, E 50%, Fx < 50 %)
Scale of assessment (preliminary/final): Weight of the course work / exam: 40/60

Learning outcomes:
Students will become familiar with the basic notions and methods of linear algebra.

Class syllabus:
1. Systems of linear equations 2. Vector spaces 3. Linear subspaces 4. Standard inner product 5. Linear maps and their matrix representations 6. Matrix algebra 7. Regular matrices and determinant

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 273

A	B	C	D	E	FX
21,98	20,51	18,32	17,58	17,22	4,4

Lecturers: prof. RNDr. Pavol Zlatoš, PhD., Mgr. Tomáš Rusin, PhD.

Last change: 13.02.2023

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-116/22	Algebra and Theoretical Arithmetic (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: 5.

Educational level: I., N

Prerequisites:

Course requirements:
Preliminary assessment: two written tests (30%)
Final assessment: oral exam (70%)
During the semester, students must obtain at least 4/10 from the preliminary assessment in order to be eligible for the oral exam. Failure to meet this requirement automatically results in an FX grade.

Learning outcomes:
Students master the basics of divisibility theory in the field of integers and its applications and will be able to actively use this knowledge to solve various problems. Furthermore, they will control the expression of real numbers using g-adic developments and selected criteria for the rationality (irrationality) of real numbers.

Class syllabus:
Divisibility of integers, greatest common divisor, Euclidean algorithm, least common multiple. Prime numbers, decomposition into the product of prime numbers. Congruences, Euler's theorem and its applications, Lagrange's theorem. Number systems and divisibility criteria. Selected arithmetic functions. Rational and irrational numbers. G-adic development of real numbers. Criteria of rationality of real numbers.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 228

A	B	C	D	E	FX
35,96	23,68	21,93	10,96	3,07	4,39

Lecturers: prof. RNDr. Pavol Zlatoš, PhD., RNDr. Jana Chalmovianská, PhD., Mgr. Tomáš Rusin, PhD.

Last change: 03.10.2025
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-207/22	Algebra and Theoretical Arithmetic (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: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Continuous evaluation: written exam (50 p.)
Final exam: oral (50 p.)
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Knowledge and use of basic notions, characteristics and methods of ring of polynomials and divisibility in ring of polynomilas over field for solving tasks related to algebraic equations, for example for examining characteristics of polynomial roots. Gaining corresponding relevant computation skills and using specific methods for finging roots of polynomial.

Class syllabus:
Rings, integral domains and fields, subrings and homomorphisms of rings, ring of polynomials over an integral domain, roots of polynomials, divisibility, Remainder theorem, Horner scheme, Euclidean division algorithm for computing the greatest common divisor of polynomials. Fundamental theorem of Algebra, polynomials over Q, R and C. Derivate of of a polynomial, multiple roots, Taylor expansion of a polynomial.

Recommended literature:
Algebra a teoretická aritmetika 1: Tibor Katriňák a kolektív. Bratislava: Univerzita Komenského 2002
Prehľad modernej algebry: Garrette Birkhoff, Saunders Mac Lane. Preložil Štefan Znám, Jaroslav Smítal . Bratislava: Alfa, 1979
Lecture notes published on the web site of the course.

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 146

A	B	C	D	E	FX
60,96	19,18	9,59	7,53	2,05	0,68

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., RNDr. Jana Chalmovianská, PhD.

Last change: 19.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-UFY-241/10	Atomic and Nuclear Physics

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: 5

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Continuous assessment: presentation of homework results (3x10 marks)
Exam: written (40 marks), oral (30 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% points.

Learning outcomes:
Graduates have a basic knowledge of Atomic and Nuclear Physics at the level of a core university course in general physics. They know how to use the concepts and methods of atomic and nuclear physics in solving problem situations. They have an idea of the boundaries between high school and university physics in the field of nuclear and nuclear in terms of work with high school youth with an increased interest in physics.

Class syllabus:
Photoelectric effect, Compton effect, Rutherford experiment, Bohr model, timeless Schrödinger equation, structure of atoms and molecules, basic properties of nuclei, structure of nuclei, transformation of nuclei, nuclear reactions, nuclear power plant, particle accelerators.

Recommended literature:
Fyzika část 5. Moderní fyzika : Vysokoškolská učebnice obecné fyziky / David Halliday, Robert Resnick, Jearl Walker ; přeložili Bohumila Lencová ... [et al.]. Brno : Vysoké učení technické VUTIUM, 2000
Všeobecná fyzika : 4 : atómová fyzika / Ján Vanovič. Bratislava : Alfa, 1980
Physics : principles with applications / Douglas C. Giancoli. Upper Saddle River, N.J. : Pearson/ Prentice Hall, 2005
Own electronic texts of the subject published through the course website.

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 195

A	B	C	D	E	FX
21,54	17,95	18,97	16,92	21,54	3,08

Lecturers: doc. RNDr. Radoslav Böhm, PhD., Ing. Jakub Kaizer, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAG/1-UXX-931/22	BSc Thesis Seminar (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:
Submission of partial output in the form of a proposal for the main objectives and structure of the bachelor's thesis, a search with an overview of available information sources on a selected topic of the bachelor's thesis.
Rating by scale:
A: 92-100%, excellent - excellent results,
B: 84-91%, very good - above average standard,
C: 76-83%, good - normal reliable work,
D: 68-75%, satisfactory - acceptable results,
E: 60-67%, sufficient - the results meet the minimum criteria,
Fx: 0-59%, insufficient - additional work required

Learning outcomes:
The student is able to define the topic of their bachelor's thesis, can correctly determine the procedures and methods of its processing, divide the process of creation into time stages, gain the ability to work selectively and correctly with the literature on the selected topic.

Class syllabus:
Definition of the topic and goal of the final work.
Study of professional literature.
Excerpt of the material.
Theoretical and methodological conception of the work.
Problem processing methodology.
Methodology of elaboration of the final work.
Formal-compositional requirements of final theses.

Recommended literature:
Selection of professional literature according to the chosen topic of the thesis;
Current directive of the Rector of Charles University on the basic requirements for final theses;
KATUŠČÁK, D.: Ako písať záverečné a kvalifikačné práce. Nitra: Enigma 2007

Languages necessary to complete the course:
slovak

Notes:

Past grade distribution
Total number of evaluated students: 81

A	ABS	B	C	D	E	FX
67,9	0,0	9,88	11,11	6,17	2,47	2,47

Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD., RNDr. Monika Dillingerová, PhD., RNDr. Martina Bátorová, PhD., doc. PaedDr. Klára Velmovská, PhD., PhDr. Jozef Pecina, PhD.

Last change: 01.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAG/1-UXX-932/22	BSc Thesis Seminar (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:

Course requirements:
Submission of partial output in the form of a comprehensive chapter of the bachelor's thesis.
Rating by scale:
A: 92-100%, excellent - excellent results,
B: 84-91%, very good - above average standard,
C: 76-83%, good - normal reliable work,
D: 68-75%, satisfactory - acceptable results,
E: 60-67%, sufficient - the results meet the minimum criteria,
Fx: 0-59%, insufficient - additional work required

Learning outcomes:
The student is able to define the topic of their bachelor's thesis, can correctly determine the procedures and methods of its processing, gain the ability to work selectively and correctly with the literature on the selected topic and appropriately present the results and important conclusions.

Class syllabus:
Definition of the topic and goal of the final work.
Study of professional literature.
Excerpt of the material.
Theoretical and methodological conception of the work.
Problem processing methodology.
Methodology of elaboration of the final work.
Formal-compositional requirements of final theses.

Recommended literature:
Selection of professional literature according to the chosen topic of the thesis;
Current directive of the Rector of Charles University on the basic requirements for final theses;
KATUŠČÁK, D.: Ako písať záverečné a kvalifikačné práce. Nitra: Enigma 2007

Languages necessary to complete the course:
slovak

Notes:

Past grade distribution
Total number of evaluated students: 61

A	ABS	B	C	D	E	FX
77,05	0,0	9,84	6,56	4,92	1,64	0,0

Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD., RNDr. Monika Dillingerová, PhD., RNDr. Martina Bátorová, PhD., PaedDr. Tünde Kozánek Kiss, PhD., prof. RNDr. Ivan Kalaš, PhD., PhDr. Jozef Pecina, PhD.

Last change: 01.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 263

A	B	C	D	E	FX
49,43	14,83	12,55	11,03	4,18	7,98

Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.

Last change: 04.07.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-160/15	Calculus for Physics Teachers

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.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: solving problems (3x10 marks), homeworks (3x10 marks), tests (2x20 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
By completing the course, students will expand and supplement their knowledge of selected parts of mathematics and can use them in solving physics problems.

Class syllabus:
Matrices, determinants. linear combination of vectors. Trigonometric functions and their graphs, trigonometric equations. Equation of the tangent. Function limit. Indefinite integral, decomposition into partial fractions, improper integral. Complex numbers, properties and operations. Algebraic, trigonometric and exponential form of complex numbers.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 91

A	B	C	D	E	FX
56,04	19,78	6,59	6,59	5,49	5,49

Lecturers: doc. PaedDr. Klára Velmovská, PhD., Mgr. Aneta Kolodzejová

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 106

A	B	C	D	E	FX
67,92	11,32	8,49	0,94	0,0	11,32

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-124/22	Combinatorics

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., N

Prerequisites:

Course requirements:
Continuous evaluation: homework
Final examination: written exam
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Gaining comprehensive overview of basic combinatorial problems and skills to solve them.

Class syllabus:
Basic combinatorial tools, permutations, combinations, binomila coeficients and Pascal triangle, binomial an multinomial theorem, combinatorial identities, principle of inclusion and exlusion, Dirichlet principle.

Recommended literature:
Kapitoly z diskrétní matematiky: Jiří Matoušek, Jaroslav Nešetřil. Praha: Karolinum, 2009
Kombinatorika a teória grafov: Martin Knor. Bratislava: Vydavateľstvo UK, 2000
Lecture notes.

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 340

A	B	C	D	E	FX
32,65	15,0	15,29	16,47	16,18	4,41

Lecturers: doc. RNDr. Martin Mačaj, PhD., doc. PaedDr. Peter Vankúš, PhD., Mgr. Martin Niepel, PhD., Mgr. Tomáš Rusin, PhD., Mgr. Štefánia Glevitzká, RNDr. Martina Bátorová, PhD.

Last change: 12.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-181/15	Complementary Exercises in Mechanics

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 series of written exams during the semester (5x20 marks).
Credits will not be awarded if the student obtains less than 50% of marks even after repeated assignments.

Learning outcomes:
After completing the course, the student will be able to independently solve computational problems at a level slightly higher than the level of a secondary school graduate in physics.

Class syllabus:
The exercise is a support for the subject Mechanics, the syllabus is in accordance with the syllabus of the subject Mechanics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 103

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

Lecturers: PaedDr. Peter Horváth, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-338/22	Computer Models and Animations for Teachers

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:
During the semester, there will be two written examinations, from which the student can obtain max. 2x 20 points. In the middle of the semester, the student submits a plan of semester work - max. 10 points. At the end of the semester, the student submits a semester work - max. 30 points. During the exam period, there will be a discussion, where the student can get max. 20 points. Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
The content of the course follows the lecture on molecular physics and thermodynamics. In addition, it relies on the knowledge gained in the subject of Atomic and Nuclear Physics. It complements and deepens the knowledge and skills acquired at the Digital Technology course. Students will get acquainted with several models, thanks to which we can illustrate the events taking place at the level of the microworld. They personally test the models in a specific application for teaching physics. Graduates of the course will be able to not only use the models, but also adapt them to the requirements of their own pedagogical practice. They will also gain a useful basis for independent modeling of molecular physics, thermodynamics and atomic / nuclear physics. They will be able to work with computer models and animations, they will be able to meaningfully combine them with simple tools and mechanical models.

Class syllabus:
Mechanical analogies in molecular physics and thermodynamics. Modelling of properties of gaseous, liquid and solid substances. Magnetic-mechanical model of processes in gases. Computer models and applets freely available on the Internet. Design of simple computer models. Models and simulations in a computer-assisted science laboratory.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 2

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

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-UXX-344/22	**Course title:** Creation of Educational Materials for 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: 5.

Educational level: I., II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation, problem solving, participation in discussions (90%), project elaboration (10%)
An exam: -
Indicative evaluation scale: e.g. A 90%, B 80%, C 70%, D 65%, E 60%

Learning outcomes:
The student:
- gain first-hand experience of how people with SEN perceive the world and how they work with a computer and a web browser
- get acquainted with the problems of users of alternative software and hardware
- learns about problem elements and aspects of the site
- get acquainted with examples of good and bad practice
- gain experience in testing the accessibility of electronic documents

Class syllabus:
- Accessibility of electronic document.
- Visually impaired users.
- Hearing impaired users.
- Users with physical disabilities.
- Users with cognitive impairments.
- Users of alternative devices.
- Accessibility of textual content
- Accessibility of multimedia content
- Accessibility of dynamic content
- Accessibility testing methods

Recommended literature:
- own electronic texts published on the website, resp. in the Moodle environment
- Špinar, D.: We create accessible websites; Zoner Press, 2004, 360 p.

- Bezáková, D. et al .: Data Creation and Presentation, Bratislava: Center for Scientific and Technical Information of the Slovak Republic, 2020, ISBN 978-80-89965-67-0.

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: doc. RNDr. Ľudmila Jašková, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-UXX-991/22	**Course title:** Defence of BSc Thesis
Number of credits: 8	
Educational level: I.	
Course requirements: Examination: state examination Scale of assessment (preliminary/final): 0/100	
Learning outcomes: When designing the bachelor's thesis, the student is able to demonstrate the ability to work creatively in the field of study in which he completed the study program. The student is able to demonstrate adequate knowledge of the issue and apply their skills in the collection, interpretation and processing of basic literature, or its application in practice or is able to solve a partial task related to the student's focus.	
Class syllabus: Course contents: 1. Contribution of the final thesis for the given field of study applied in the collection, interpretation and processing of basic professional literature, or the extent to which the student has mastered the application of theoretical principles in practice and whether the hypotheses presented in the work are verifiable; 2. Originality of the thesis (the final thesis must not have the character of a plagiarism, must not infringe the copyrights of other authors), part of the documentation for the defense of the final thesis as a subject of state examination is the protocol of originality from the central register. 3. Correctness and correctness of citation of used information sources, research results of other authors and author groups, correctness of description of methods and working procedures of other authors or author groups; 4. Compliance of the structure of the final work with the prescribed composition defined by Internal Regulation no. 12/2013; 5. Respecting the recommended scope of the final thesis (the recommended scope of the bachelor's thesis is usually 30 - 40 standard pages - 54,000 to 72,000 characters, including spaces), the adequacy of the scope of the thesis is assessed by its supervisor; 6. Linguistic and stylistic level of work and formal arrangement; 7. The method and form of the defense of the final thesis and the student's ability to adequately respond to comments and questions in the opinions of the supervisor and the opponent. 8. In the teaching of art-educational subjects, the final work and its defense may also include the presentation of artistic outputs and performances.	
State exam syllabus:	
Recommended literature: according to the topic of the bachelor thesis	
Languages necessary to complete the course: Slovak, English	

Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-336/22	Design of Texts and Tasks for Science Education

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:
In the middle of the semester, the student submits a plan of semester work - max. 10 marks. At the end of the semester, the student submits a semester work - max. 20 marks. Defence of the semester work is for 10 marks. In the exam period, there will be a structured discussion, where the student can get max. 10 marks. Credits will not be awarded if the student scores less than 50% of the marks.

Learning outcomes:
The student knows the selected principles of creating textbook materials and can use these principles when writing a chapter to a textbook and a text to a popular science journal.

Class syllabus:
Phases of the intended curriculum (Bain Idea, content goals, directional questions, standards). Modeling the student's input knowledge and experience. Selection of contexts for use in texts. Scene for learning. Problem situations and tasks for qualitative solution estimation, strategies for solving physics problems by novices and experts, problem tasks, complex tasks, tasks aimed at concept understanding. Formulation of teaching text. Analysis of the created text. Verification of the text on a model student.

Recommended literature:
Held Ľ. a kol, (2016). Východiská prípravy prírodovedného kurikula pre základnú školu 2020 II
Harlen, W. (2015). Working with Big Ideas of Science Education. Trieste: Science Education Programme of IAP.
Klentschy, M., & Thompson, L. (2008). Scaffolding Science Inquiry Through Lesson Design. Heinemann.
Demkanin, P. (2018) Didaktika fyziky
Course material

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 7

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

Lecturers: doc. RNDr. Peter Demkanin, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAG/1-UXX-237/22	Digital Educational Technologies for Descriptive Geometry

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., II.

Prerequisites: FMFI.KDMFI/1-UXX-137/22 - Digital Literacy

Course requirements:
The student can obtain 100% of the grade during the semester. The student prepares assignments of various types in various digital tools, he / she needs at least half of the available points to successfully obtain the final grading.
Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0).
Scale of assessment (preliminary/final): Preliminary assessment 100% (homework assignments) / 0% final exam

Learning outcomes:
The course graduate:
1. will learn to practically demonstrate work with projection methods of both the parallel and central projection via selected graphic digital tools
2. will be able to practically create a digital presentation of static and dynamic sketches of projections of three-dimensional objects into a suitably chosen projection plane (projections, anaglyphs, animations)
3. will work practically to incorporate basic norms and standards of technical drawing in suitable software tools while creating projections of three-dimensional objects into the chosen projection plane by the given imaging method
4. using specific software tools, they will practically learn the difference between theoretical and numerical model of foundational concepts and objects in the field of geometry using specific software tools, consisting of conceptually more complex geometric models and their visualizations

Class syllabus:
1. useful digital tools for projections imaging (CAD systems, GeoGebra, Maxima, other online tools)
2. static and dynamic digital presentation of concepts from imaging methods of parallel and central projection (digital construction of linear perspective, Monge's projection, military and cavalry axonometry)
3. technical drawing, its norms and standards and their use in professional teaching practice

Recommended literature:
1. electronic texts published on the subject's website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 87

A	B	C	D	E	FX
77,01	13,79	5,75	2,3	1,15	0,0

Lecturers: Mgr. Marcel Makovník, PhD., Ing. Martin Čavarga

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-240/22	Digital Educational Technologies for Informatics

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., II.

Prerequisites:

Course requirements:
Continuous assessment: The student can get 50% points for active participation in seminars and another 50% points for completing tasks.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student:
- uses modern DT to plan, prepare and implement its future teaching
- knows suitable digital tools for teaching informatics, can search for them and critically evaluate them
- analyzes educational software for teaching informatics, critically evaluates it and decides on its inclusion in the teaching process
- assesses and decides why, when, where and how DT will contribute to the achievement of educational goals
- is able to manage classroom teaching so that teamwork with the support of DT is used for the benefit of the cognitive process of students,
- is able to communicate with colleagues and students with the help of DT
- uses DT in pupil assessment
- DT also uses to collect and analyze data on students' educational progress, to interpret their results, etc.

Class syllabus:
- The future teacher of informatics and his further education in various areas of informatics.
- Search, use and evaluation of currently available digital tools to support computer science teaching.
- Future computer science teacher as an author of sample solutions to programming problems.
- Preparing the future teacher for the need and updating the DT he uses for teaching.
- Adaptation of the future teacher to new versions of programs for various areas of informatics.
- Future computer science teacher as the author of new tasks for primary and secondary school students.

- Own creative work of a computer science teacher as an author of digital teaching materials for teaching computer science.
- Computer science teacher as a user and didactics of various programming microworlds.
- Advanced techniques for programming environments to teach the areas of Procedures, Problem Solving, Algorithmic Thinking.
- Digital systems suitable for teaching management, communication with students and parents.

Recommended literature:
Own electronic texts published on the website, resp. in the Moodle environment

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 112

A	B	C	D	E	FX
70,54	14,29	9,82	4,46	0,89	0,0

Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-341/22	Digital Educational Technologies for Mathematics

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., II.

Prerequisites: FMFI.KDMFI/1-UXX-137/22 - Digital Literacy

Course requirements:
Continuous assessment: tasks
Indicative rating scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student uses modern digital technologies (DT) to plan, prepare and implement their future teaching (in the relevant subject) and to support the achievement of their educational goals. They has an overview of suitable educational resources for the subject, can search, select and critically evaluate them. They also has an overview of DTs that facilitate the assessment and recording of the cognitive process and educational progress of their students. The student:
- analyzes multimedia educational software from the point of view of the given approbation subject, critically decides on its inclusion in the teaching process,
- critically evaluates educational and support software and other digital content, is able to formulate requirements for educational software and digital content,
- assesses and decides why, when, where and how DT will contribute to the achievement of its educational goals,
- has an overview of how:
- use DT in an appropriate and productive way to help achieve the educational objectives of its subject,
- manage classroom teaching so that teamwork with DT support is used to benefit students' cognitive process,
- communicate with colleagues or pupils through appropriate and effective tools to achieve their teaching objectives,
- use modern DT in evaluating student education,
- use DT to collect and analyze data on students' educational progress, to interpret their results, etc.

Class syllabus:
● Analysis, evaluation and assessment of educational software and digital educational content for the relevant subject.

● Digital technologies usable in the design, preparation, implementation and analysis of the teaching process of the relevant subject.
● Different forms, means and tools of communication in the educational process and in the school environment (eg between school and parents).

Recommended literature:
Relevant literature for the approbation subject.

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 68

A	B	C	D	E	FX
61,76	16,18	8,82	8,82	1,47	2,94

Lecturers: RNDr. Monika Dillingerová, PhD., Mgr. Jana Havlíčková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-239/22	Digital Educational Technologies for Physics

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., II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation; during the semester students develop a project (digital model).
Final evaluation: Presentation of the created digital model and a demonstration of its practical application in teaching.
Indicative rating scale: A = (90, 100]%, B = (80, 90]%, C = (70, 80]%, D: (60, 70]%, E: (50, 60]%).
Scale of assessment (preliminary/final): 20 / 80

Learning outcomes:
Student by completing the course:
- acquire basic knowledge and skills for creating activities with a focus on the digital model,
- be able to make meaningful use of digital technologies in modeling different task situations,
- will be able to plan student activities leading to the creation of digital models,
- will be able to develop interdisciplinary relationships between mathematics, physics and computer science.

Class syllabus:
- basic orientation in the PPPL software environment (computer aided science laboratory)
- dynamic modeling of physical phenomena
- creation of a simple model - body fall
- extension of a simple model with environmental resistance, controls, graphic output
- modeling of oblique litter with environmental resistance
- application of the created model in solving physical problems and situations from everyday life
- case studies in school physics (in terms of models and modeling)
- creation of own model according to the student's choice

Recommended literature:
The teacher's own electronic texts published on the website, resp. in the Moodle environment.

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 102

A	B	C	D	E	FX
74,51	16,67	5,88	1,96	0,98	0,0

Lecturers: PaedDr. Lukáš Bartošovič, PhD., doc. RNDr. Peter Demkanin, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-137/22	Digital Literacy

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.

Educational level: I., II.

Prerequisites:

Course requirements:
Continuous assessment: students will work on one major project throughout the semester and will be assessed continuously on the completion of the associated subtasks
Indicative grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students are able to take a research-oriented approach to topics related to the digital age. They can effectively search for information on a given topic, assess its relevance, reflect and discuss it. They are able to specify an unexplored area within a chosen topic and find a way to find out something new about it. They use appropriate digital tools in their research that enable them to collect, process and present the necessary data. They are able to create online documents and work collaboratively within them.

Class syllabus:
- exploring current topics related to digital technologies and discussing them
- working collaboratively to design, conduct and present your own research or investigation on a chosen topic
- using online forms to collect different types of data
- processing and interpreting data using digital tools
- writing an article that incorporates theoretical background and your own findings
- creating a presentation using online tools
- presenting the results of your own research

Recommended literature:
Transformations of the school in the digital age / Ivan Kalaš and team. Bratislava: Slovenské pedagogické nakladateľstvo - Mladé letá, 2013
Pedagogicko-psychologické otázky online vzdělávání / Michal Černý. Brno: Masaryk University, 2018
Own electronic texts published on the website, resp. in the Moodle environment

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 257

A	B	C	D	E	FX
79,38	9,34	4,67	1,95	1,17	3,5

Lecturers: Mgr. Mária Čujdíková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-342/22	Digital Technologies for Students with SEN

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: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: active participation in lessons (elaboration of assigned tasks, participation in discussions)
Exam: no
Indicative assessment scale: A 90%, B 80%, C 70%, D 65%, E 60%

Learning outcomes:
Gain an overview of the possibilities of using digital technologies (DT) in the education of students with special educational needs (SEN). To get acquainted with the methods of teaching students with SEN and the creation of accessible study materials.

Class syllabus:
- specification of student with SEN,
- categorization of pupils with SEN,
- assistive technologies for pupils with SEN and their way of working with DT,
- accessibility of information on the web,
- principles of universal design,
- use of DT for the preparation of study materials for pupils with SEN,
- recommended didactic methods in teaching pupils with SEN,
- the use of DT to increase the inclusiveness of schools.

Recommended literature:
Use of ICT in children with special needs / Pavel Zikl ... [et al.]. Prague: Grada, 2011
Basics of inclusive pedagogy: child with disability, disruption and threat at school / Viktor Lechta (ed.); translated by Magda Wdowyczyn. Prague: Portal, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 101

A	B	C	D	E	FX
73,27	10,89	7,92	2,97	0,0	4,95

Lecturers: doc. RNDr. Ľudmila Jašková, PhD., PaedDr. Mgr. Natália Kováčová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-238/22	Digital Technologies in Education

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

Number of credits: 3

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:
The final grade includes an evaluation for the developed designs of teaching models with the support of technology, a total of a maximum of 60 points and an oral exam, a total of a maximum of 40 points. To advance to the oral exam, the student must obtain at least 30 points for teaching models. To pass the oral exam, the student must obtain at least 20 points. The final grade includes an evaluation for the developed teaching models and an oral exam. In order to obtain an A rating, it is necessary to obtain at least 91 points, to obtain an B rating at least 81 points, to obtain a C rating at least 71 points, to obtain a D rating at least 61 points and to obtain an E rating at least 50 points.
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
By completing the course, the student will be able to critically assess the safety, suitability and meaningfulness of the application of digital technologies in the teaching process. Understand the risks, opportunities and limits of integrating digital technologies into teaching and their importance in supporting the learning process. He will be able to assess the quality of digital resources with educational content in the context of teaching needs. Can distinguish between false, misleading or truth-altering information and use procedures to verify the veracity, timeliness and scientific accuracy of published facts and facts. Can design an appropriate and effective application of selected digital technologies in the teaching program.

Class syllabus:
Digital resources and digital technologies vs. educational digital resources and educational technologies; Security in the digital world; BYOD in the teaching process - benefits, challenges, limits and limitations; Digital literacy and its importance in the digital world; Possibilities and limits of the use of digital technologies in support of personalized learning, research and research-oriented teaching; Evaluation of the quality of educational technologies and the possibility of their integration into teaching; Selected digital technologies supporting the teaching process.
1. Digital technologies - historical development, use, present, perspectives.
2. Digital literacy - what we mean by digital literacy, methods and means of development DG, education and DG.

3. Digital technologies in education - technologies vs. educational technologies, groups of technologies usable in education (Comprehensive educational environment, educational programs, mobile applications, virtual laboratories, applets, modules, accessories ...).
4. Digital technologies in education - educational content, assessment of suitability and adequacy of technology to support teaching, information retrieval, support of special educational needs.
5. Digital technologies in education - tools for communication, cooperation, creation and sharing of results.
6. Digital technologies in education - systems to support education and organization of the educational process.
7. Digital technologies in education - teaching methods and strategies supporting meaningful and appropriate applications of DT in education.
8. Digital technologies in education - social and ethical aspects of the use of DT in education.
9. Digital content creation - available software tools for creating educational content, teaching materials, quizzes, interactive exercises.
10. Security in the digital age - fake news, hoaxs, detectors and algorithms for their detection.
11. Digital content - procedures for verifying the truthfulness, accuracy and timeliness of information available on the Internet.
12. Research in the use of digital technologies in education.

Recommended literature:

1. Brestenská, B. et al. (2020). Innovative learning with the support of digital technologies. Bratislava: Comenius University in Bratislava, 2020. ISBN: 978-80-223-4927-7
2. Karolčík, Š., Čipková, E., Digital educational resources in the context of evaluating their quality. 1st ed. Bratislava: Comenius University in Bratislava, 155 p
3. ISTE standards for students - https://www.iste.org/standards/iste-standards-for-students
4. ISTE standards for teachers - https://www.iste.org/standards/iste-standards-for-teachers
5. Gormally, Carickman, Peggy; Hallar, Brittan; and Armstrong, Norris (2009) "Effects of Inquiry-based Learning on Students' Science Literacy Skills and Confidence," International Journal for the Scholarship of Teaching and Learning: 3 (2), Article 16. Available at: http: // digitalcommons .georgiasouthern.edu / ij-sotl / vol3 / iss2 / 16
6. Tsung-Hau Jen, Yi-Fen Yeh, Ying-Shao Hsu, Hsin-Kai Wu, Kuan-Ming Chen. (2016). Science teachers' TPACK-Practical: Standard-setting using an evidence-based approach. Computers & Education, Volume 95, Pp. 45-62, DOI: https://doi.org/10.1016/j.compedu.2015.12.009
7. REDECKER, Christine and Yves PUNIE. European Framework for the Digital Competence of Educators: DigCompEdu [online]. © European Union 2017 [cit. 2021-12-09]. Available at: https://op.europa.eu/en/publication-detail/-/publication/fcc33b68-d581-11e7-a5b9-01aa75ed71a1/language-en
8. Digital technologies are changing the cognitive process [online]. State Pedagogical Institute [cit. 2021-12-09]. Available at: https://www.statpedu.sk/files/sk/o-organizacii/projekty/projekt-dvui/publikacie/digitalne_technologie_menia_poznavaci_proces.pdf

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 204

A	B	C	D	E	FX
69,12	13,24	8,33	3,43	1,96	3,92

Lecturers: PaedDr. Andrea Hrušecká, PhD., PaedDr. Roman Hrušecký, PhD., PaedDr. Mgr. Natália Kováčová, PhD.
Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-311/22	Educational Games

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.

Educational level: I.

Prerequisites:

Course requirements:
During the semester, students prepare a written semester work. Project of the work (10 marks), preliminary work (20 marks), final version (30 marks), defence (20 marks), discussion on the work of peers (20 marks).
Rating A = (90, 100]%, B = (80, 90]%, C = (70, 80]%, D: (60, 70]%, E: (50, 60]%).
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
The student will gain basic knowledge about the specifics of teaching physics in the outdoor environment. At a level appropriate to the future beginning physics teacher, will know the main characteristics of non-formal education and will be able to use selected methods of non-formal education in teaching physics in primary and secondary schools.

Class syllabus:
Game, its role in the life of an individual of different ages. The importance of the game for the development of cognitive skills. Game features in education. Didactic and educational game. Spontaneous and directed game. Types and functions of questions. Stages of creating an educational game - goal, choice of context, ideological intention, rules of the game, creation of tasks, basis for evaluation discussion. Game testing. Teacher functions, pedagogical intervention during the educational game. Evaluation of the success of the educational game.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 14

A	B	C	D	E	FX
85,71	7,14	7,14	0,0	0,0	0,0

Lecturers: doc. PaedDr. Viera Haverlíková, PhD.
Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/2-MPG-247/22	Effective Writing of Proffesional Texts

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., II.

Prerequisites:

Course requirements:
The student can obtain 100% of the grade during the semester. The student prepares assignments of various types in various digital tools, he / she needs at least half of the available points to successfully obtain the final grading.
Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0).
Scale of assessment (preliminary/final): Preliminary assessment 100% (homework assignments) / 0% final exam

Learning outcomes:
1. The graduate will acquire advanced skills needed to work in the LaTeX typographic system.
2. The graduate will acquire basic skills in the computer algebra system wxMaxima. Learns the basic structures and procedures of the environment's language, learns to write simple scripts and generate visualizations of basic mathematical and geometric concepts.
3. The graduate will get acquainted with the methodological procedures of writing longer professional texts, from the stage of preparation to the finalization of the text.

Class syllabus:
1. LaTeX: Typing mathematical formulae in LaTeX. Drafting texts in LaTeX. Additional document settings in LaTeX, more advanced typesetting concepts (document settings, templates, custom environment definitions, etc.). LaTeX presentations.
2. wxMaxima: Introduction to the environment. Setup and control. Basic programming concepts (variable, cycle, condition, data structures). Basic mathematical concepts and structures (matrices, equations, maps). Rendering and visualization in plane and space (polygons, curves, surfaces). Animation and visualization of processes.
3. Methodology of writing professional texts: basic thought procedures for creating longer professional texts.

Recommended literature:
Electronic texts, scripts and other materials published on the teacher's website.
https://www.latex-project.org/help/documentation/
https://maxima.sourceforge.io/documentation.html

https://home.csulb.edu/~woollett/mbe.html

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 29

A	B	C	D	E	FX
27,59	27,59	13,79	6,9	20,69	3,45

Lecturers: RNDr. Martina Bátorová, PhD., doc. RNDr. Andrej Ferko, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF+KDMFI/1-UFY-141/15	Electromagnetism

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: 2.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: written tests, homework
Exam: oral, written
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% marks.

Learning outcomes:
Students have knowledge of electricity and magnetism at the level of the core course of university physics. They will master the basic calculation methods and procedures for solving physics problems in electromagnetism. They will understand the boundaries between secondary school physics and university physics in the field of electricity and magnetism in terms of working with high school youth with an increased interest in physics.

Class syllabus:
Electric charge. Coulomb's law. Electric field. Gauss's law. Electric potential. Capacity. Electric current and resistance. Circuits. Magnetic field. Magnetic field of electric current. Electromagnetic induction. Magnetic field in matter. Maxwell's equations. Electromagnetic oscillations. Alternating currents. Electromagnetic waves.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
21,51	7,53	22,58	16,13	22,58	9,68

Lecturers: RNDr. Eduard Masár, PhD., doc. RNDr. Peter Demkanin, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 318

A	B	C	D	E	FX
77,36	8,81	4,4	1,26	0,94	7,23

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.- učebnica publikovaná online
Anglický jazyk pre študentov FMFI UK : Matematika: Alexandra Maďarová, Eva Foltánová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 7538

A	B	C	D	E	FX
29,53	22,82	18,16	12,52	7,87	9,1

Lecturers: Mgr. Eva Foltánová, Mgr. Ing. Jana Kočvarová, Mgr. Ľubomíra Koženhubová, Mgr. Alexandra Maďarová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD., Mgr. Valéria Medárová, PhD., Mgr. Katarína Hromadová, PhD.

Last change: 16.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD., Mgr. Valéria Medárová, PhD.
Last change: 20.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.- učebnica publikovaná online
Anglický jazyk pre študentov FMFI UK : Matematika: Alexandra Maďarová, Eva Foltánová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1461

A	B	C	D	E	FX
15,47	18,96	22,72	18,21	18,14	6,5

Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD., Mgr. Valéria Medárová, PhD., Mgr. Katarína Hromadová, PhD.

Last change: 16.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.- učebnica publikovaná online
Anglický jazyk pre študentov FMFI UK : Matematika: Alexandra Maďarová, Eva Foltánová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
Učebnica je nepublikovaná, k dispozícii v elektronickej podobe na webovej stránke KJP.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 4299

A	B	C	D	E	FX
25,17	28,15	21,61	11,82	6,05	7,21

Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD., Mgr. Valéria Medárová, PhD.

Last change: 16.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 499

A	B	C	D	E	FX
48,5	19,44	16,63	7,82	2,0	5,61

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 128

A	B	C	D	E	FX
48,44	24,22	17,19	5,47	0,78	3,91

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-UMA-951/22	**Course title:** Fundamentals of Mathematics
Number of credits: 2	
Educational level: I.	

Course requirements:

The course 1-UMA-951/15 Fundamentals of Mathematics has two parts:
A) School mathematics test
The test uses the types of tasks from mathematics tests for the external part of the Matura exam and from mathematics tests at the entrance exams at FMFI UK, a total of 20 short-answer tasks or with a choice of several options.
B) Oral exam
The student draws an assignment, which has 3 parts - three different circuits
1. geometry, 2. combinatorics, probability and statistics, 3. algebra and theoretical arithmetic, 4. mathematical analysis.
Each part contains
- the task from the relevant area, the solution of which (including the justification of individual steps) the student will demonstrate during the oral answer,
- definition of the area of the relevant heading, which is related to the solved task; in the oral answer the student will state the basic concepts and statements of this area, or their relationship to the problem.
Maximum points:
• 20 points from the school mathematics test (1 point for each correct answer),
• 25 points for each of the three parts of the assignment (10 for solving the problem, 15 for the theoretical part),
thus a maximum of 20 + 3.25 = 95 points in total.
A student completes the course if he/she obtains at least 5 points for each of the three parts of the assignment and a total of at least 46 points.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:

State exam from selected areas of the core subjects of the program.

State exam syllabus:

Geometry
1. Study of affine space by analytical method
(subspaces - linear varieties, their parametric and general equations, intersections and mutual positions)
2. Study of Euclidean space by analytical method
(scalar product of vectors and metrics, perpendicularity of subspaces, distances of subspaces, angles)
3. Affine representations of spaces
(analytical expression of affine mapping, invariants of affine transformations, group of similarities of Euclidean space)

4. Axiomatic construction of geometry: incidental and ordered plane
(axioms of incidence and arrangement and their consequences, models of incident and ordered plane.)
5. Axiomatic construction of geometry: Hilbert's and Euclidean planes
(axioms of similarity and their consequences: triangles of similarity of triangles, properties of a triangle, construction of perpendiculars and parallels; axioms of parallelism and axioms of continuity)
Combinatorics, probability and statistics
1. Mathematical induction (principle of mathematical induction; connection with good arrangement of natural numbers; examples of use).
2. Pigeon/Dirichlet principle (formulation and some applications).
3. Combinatorial principles (addition principle, multiplication principle, bijection principle, counting in two ways).
4. Binomial coefficients and binomial theorem (definition and formula for binomial coefficients and some of their properties; binomial theorem formulation).
5. Principle of inclusion and exclusion (formulation and examples of use).
6. Probability, its basic properties. Conditional probability and independence of events. Complete Probability Theorem, Bayes Theorem.
7. Probability distributions, their properties and characteristics (distribution function, density, mean value, dispersion). Special types of distributions (alternative, binomial, geometric, exponential, normal). Central limit theorem.
8. Descriptive statistics (location and variability characteristics). Point estimates (random selection; estimates of mean and dispersion and their properties).
9. Confidence intervals for the mean value. Hypothesis testing, one-choice tests on the mean value.
Algebra and theoretical arithmetic
1. Linear representations and their matrices, product of matrices, inverse matrices.
2. Vector spaces and subspaces, linear combinations of vectors, linear representations.
3. Finite-dimensional vector spaces, base and dimension of finite-dimensional vector space.
4. Systems of linear equations, the existence of a solution of an inhomogeneous system of linear equations, the structure of the set of solutions of a homogeneous system of linear equations.
5. Divisibility in the field of integers. Theorem on division with the rest. The largest common divisor and the smallest common multiple of two integers. Euclidean algorithm for calculating the greatest common divisor.
6. Prime numbers, their properties, theorem about the decomposition of a natural number into the product of prime numbers. Number systems.
7. Congruences, divisibility criteria of natural numbers expressed in the decimal system, Euler's theorem, small Fermat's theorem.
Mathematical analysis
1. Limits of sequence and function, basic theorems about limits.
2. Continuity, properties of continuous functions on intervals, optimization - search for global extrema of continuous functions on closed intervals, relationship between continuity and differentiability of a function.
3. Derivation of a function, Lagrange's theorem on mean value and its use in investigating the monotonicity of functions, necessary and sufficient conditions for the existence of local extrema of differentiable functions.
4. Approximation of differentiable function by polynomials, equation of tangent, equation of Taylor polynomial of n-th degree.
5. Indefinite integral and primitive function, basic integration formulas, per partes method and substitutions.

6. Riemann integral, definition and calculation, heuristic derivation of formulas for calculation of area content, length of curve, volume of rotating body and surface of rotating body.

Languages necessary to complete the course:
slovak, enghlish

Last change: 13.04.2023

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-121/24	Game-based Learning in Mathematics Education (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: 1., 3.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: proposal of motivational activities, output in front of the board
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will get acquainted with some activating methods and motivational activities suitable for teaching mathematics, physics, computer science and other science subjects. Based on this, they will create a proposal of their own activities, which they will present in front of their classmates and thus gain valuable experience for their future teaching practice.

Class syllabus:
- Popularization lectures
- Didactic games
- Didactic competitions
- Motivational activities focused on mathematics, physics, informatics and other science subjects suitable for camps and schools in nature

Recommended literature:
Didactic games in mathematics / Peter Vankúš. Bratislava: KEC FMFI UK, 2012
Child, school and mathematics: Constructivist approaches to teaching / Milan Hejný, František Kuřina. Prague: Portal, 2001
Mathematical feeling / Jo Boalerová. Bratislava: Tatran, 2016
Own electronic materials published via the subject's website (course in LMS Moodle)

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 62

A	B	C	D	E	FX
93,55	0,0	0,0	0,0	0,0	6,45

Lecturers: doc. PaedDr. Peter Vankúš, PhD.

Last change: 03.06.2024

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-122/24	Game-based Learning in Mathematics Education (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: 1

Recommended semester: 2., 4.

Educational level: I.

Prerequisites:

Course requirements:
Ongoing evaluation: implementation and evaluation of activities during the concentration
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be able to implement their motivational activities during the training. We will then evaluate these activities and suggest possible modifications. The implementation of their own activities and their subsequent reflection will provide students with valuable experience for the preparation of their future educational activities aimed at motivating the teaching of mathematics, physics, computer science and other science subjects.

Class syllabus:
- Popularization lectures
- Didactic games
- Didactic competitions
- Motivational activities focused on mathematics, physics, computer science and other science subjects suitable for camps and schools in nature.

Recommended literature:
Didactic games in mathematics / Peter Vankúš. Bratislava: KEC FMFI UK, 2012
Child, school and mathematics: Constructivist approaches to teaching / Milan Hejný, František Kuřina. Prague: Portal, 2001
Mathematical feeling / Jo Boalerová. Bratislava: Tatran, 2016
Own electronic materials published via the subject's website (course in LMS Moodle)

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 26

A	B	C	D	E	FX
92,31	0,0	0,0	0,0	0,0	7,69

Lecturers: doc. PaedDr. Peter Vankúš, PhD.

Last change: 16.02.2026

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-142/22	Geometry (0)

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:
Final evaluation: The student prepares a portfolio of at least three activities in geometry in the GeoGebra program. At the final evaluation, one must be selected at random. In addition, it responds from a randomly selected topic. It consists of theory and example.
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Get an overview of the geometry of primary and secondary schools. Concepts, facts, procedures.

Class syllabus:
1. GeoGebra
2. Construction tasks - what at the elementary school, high school is a construction task, respectively. its solution
3. Pythagorean and Euclidean theorems
4. Rectangles
5. Circle, central, circumferential and section angle
6. Views, stacking of axial symmetries, vectors and displacement (introduction to the term vector)
7. Analytic geometry (vector) 2D
8. Analytical geometry 3D
9. 3D geometry - floor plan, front view, side view, constructions from cubes
10. Cuts and other bodies

Recommended literature:
elementary and high school mathematics textbooks
Seminár z matematiky : 3. časť / Zbyněk Kubáček, Ján Žabka Bratislava : Mapa Slovakia Plus s.r.o., 2020

Languages necessary to complete the course:
slovak

Notes:

The course is primarily intended for teacher training students; students of other programs can enroll in it only with the consent of their guarantor.

Past grade distribution
Total number of evaluated students: 62

A	B	C	D	E	FX
40,32	12,9	12,9	14,52	14,52	4,84

Lecturers: RNDr. Monika Dillingerová, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-107/15	Geometry (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., N

Prerequisites: FMFI.KAG/1-UMA-112/22 - Algebra and Theoretical Arithmetic (1)

Course requirements:
Preliminary assessment: homework (10%), written tests (20%)
Final assessment: oral exam (70%)
During the semester, students must obtain at least 4/10 from the preliminary assessment in order to be eligible for the oral exam. Failure to meet this requirement automatically results in an FX grade.

Learning outcomes:
Master the analytical methods of studying the geometric properties of subspaces of n-dimensional affine (or Euclidean) space and its maps

Class syllabus:
- n-dimensional affine space A^n and Euclidean space E^n;
- coordinate systems;
- affine maps;
- orientation of affine space;
- subspaces / linear varieties in E^n: parametric description and implicit equations, relative positions, distances and angles of some subspaces;
- invariants of affine maps (fixed points, eigenvectors);
- isometries, reflections as generators of the group of isometries of the Euclidean plane

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 269

A	B	C	D	E	FX
19,7	14,13	20,82	16,36	16,36	12,64

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., RNDr. Jana Chalmovianská, PhD.

Last change: 02.10.2025
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-220/15	Geometry (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., N

Prerequisites:

Course requirements:
Preliminary assessment: homework (20%), written tests (40%)
Final assessment: oral exam (40%)
Grading: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
The student gets familiar with the axiomatic construction of planimetry. He learns partly Euclid's, but especially Hilbert's axiomatic system. They will practice thorough mathematical argumentation and get knowledge of several models of different groups of axioms.

Class syllabus:
- history of axiomatics of geometry, Euclidean constructions
- axioms of incidence, incidence geometry models
- axioms of order, ordered plane models
- axioms of congruence, theorems about the congruence of triangles, arithmetics of line segments and angles, Hilbert plane
- controversy of the axiom of parallelism
- axioms of continuity and circle continuity principles
- some of Apollonius' problems

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 257

A	B	C	D	E	FX
17,51	15,95	26,07	17,9	11,67	10,89

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., RNDr. Jana Chalmovianská, PhD.

Last change: 21.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-UMA-301/22	Geometry (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: 4

Recommended semester: 5.

Educational level: I., N

Prerequisites:

Course requirements:
Preliminary assessment: homework
Final assessment: written exam
Grading: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
The main goal of the course is to strengthen the spatial imagination. The students learn the basics of polyhedral theory, the possibilities of displaying three-dimensional objects in a plane and also maps of two-dimensional spaces, which require embedding into three dimensions. They get practice in solving stereometric problems.

Class syllabus:
- introduction to theory of polyhedral, Euler's theorem, Platonic solids
- incidence (sections of solids) and metric (distances and angles) problems in stereometry
- principles of parallel projection, orthogonal projection (Monge projection), oblique projection
- ellipse as an affine image of a circle
- central projection, linear perspective, basics of projective space
- non-linear projection: stereographic projection, other cartographic representations

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 242

A	B	C	D	E	FX
31,4	19,83	18,18	14,46	8,26	7,85

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., RNDr. Barbora Pokorná, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 874

A	B	C	D	E	FX
38,33	24,71	18,42	8,81	2,86	6,86

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

Last change: 05.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 542

A	B	C	D	E	FX
38,01	19,56	19,56	12,36	3,51	7,01

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

Last change: 05.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 191

A	B	C	D	E	FX
45,03	23,04	19,37	6,81	2,09	3,66

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

Last change: 05.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 05.09.2025

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/1-MXX-491/22	**Course title:** 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: 124

A	B	C	D	E	FX
76,61	17,74	4,03	0,0	0,0	1,61

Lecturers: Mgr. Ľudmila Hlinová

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-343/22	Interesting Extracurricular Activities

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.

Educational level: I., II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation; during the semester, students prepare a written semester work.
Indicative rating scale A = (90, 100]%, B = (80, 90]%, C = (70, 80]%, D: (60, 70]%, E: (50, 60]%).
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
Student by completing the course:
- acquire basic knowledge about the specifics of leading hobby groups,
- acquire basic knowledge of the specifics of working with different age groups and age-mixed groups,
- will be able to actively apply selected methods of non-formal and informal learning,
- will be able to develop interdisciplinary relationships.

Class syllabus:
- Formal, non-formal and informal learning.
- Objectives of extracurricular activities - knowledge, skills, attitudes, relationships.
- Situation analysis - condition analysis, environment analysis and needs analysis.
- Organizational forms of extracurricular leisure activities.
- Methods of work in the department of interest.
- Examples of good practice.

Recommended literature:
own electronic texts published on the website, resp. in the Moodle environment
Pešek, T., Škrabský, T., Novosádová, M., Dočkalová, J. 2019. The syllabary of non-formal education in youth work, Bratislava, YouthWatch, ISBN 978-80-973031-2-9

Languages necessary to complete the course:
Slovak

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: doc. PaedDr. Viera Haverlíková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-310/15	Introduction to Didactics of Physics

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., N

Prerequisites: FMFI.KDMFI/1-UFY-232/22 - School Physics (1)

Course requirements:
Continuous assessment: presentation of the results of individual work (2x25 marks)
Exam: written (20 marks), oral (30 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
The graduate will know the relationship between pedagogy, psychology and physics didactics. Graduates - future physics teachers will understand the basic goals, methods and means of physics education.

Class syllabus:
Didactics of physics as applied science. Current goals and problems of physical education. Teaching strategies. Cognition methods. Models and modelling in physics teaching. The empirical and theoretical approach to knowledge mediation. Means of teaching physics. Experiment. Mathematical procedures. Coordinate graph function. Solving physics problems. Microcomputer supported and multimedia lab. Possibilities of influencing students' motivation by teachers. Preparation for teaching. Evaluation of students' knowledge.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 80

A	B	C	D	E	FX
61,25	15,0	12,5	6,25	2,5	2,5

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-220/15	Introduction to School Experiments

Educational activities:
Type of activities: lecture / laboratory 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., N

Prerequisites:

Course requirements:
Continuous assessment: written test (10 marks), individual work projects (2x20 marks), practical test (10 marks)
Exam: oral (40 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% marks.

Learning outcomes:
Graduates have the knowledge, skills and abilities necessary for the methodology and technique of performing several types of school physical measurements and experiments in the physics curriculum of lower secondary and high schools.

Class syllabus:
Phases of a school experiment, types of school experiments, measurements and observations, possibilities of a computer-aided science laboratory, measurement with sensors, basics of video measurement, basics of preparation of interactive animations. Preparation of instruction for a student for an experiment planned by a teacher, preparation and assignment of a student planning experiment. Empirical cognition in school physics, basics of measuring results, student work in empirical cognition.

Recommended literature:
Evidence based teaching : A practical approach / Geoff Petty. Cheltenham : Nelson Thornes, 2006
Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006
Demkanin, P, Didaktika fyziky, UK 2018
Klentschy, Michael P.: Scaffolding Science Inquiry Through Lesson Design
Own electronic texts of the subject published through the subject's website.

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 102

A	B	C	D	E	FX
56,86	22,55	13,73	0,98	2,94	2,94

Lecturers: doc. RNDr. Peter Demkanin, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-310/23	Introduction to didactics of mathematics

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:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

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

Lecturers: doc. PaedDr. Mária Slavíčková, PhD.

Last change: 31.05.2023

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. ſBrilliance 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
37,79	23,84	15,12	11,05	5,23	6,98

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-143/22	Mathematical Analysis (0)

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:
Continuous assessment: seminar activity, two continuous tests
Final evaluation: test
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will deepen their knowledge of selected elementary functions, which they will use in introducing new concepts related to the functions of one real variable, sequences of real numbers and their properties. They will be able to properly apply digital technologies, solve tasks leading to modeling of selected phenomena from real life (e.g., cell proliferation, radioactive decay, physical laws, etc.)

Class syllabus:
Exponential functions, properties of powers (also rational), Logarithmic functions, Goniometric functions, Cyclometric functions, Sequences of numbers, intuitive notion of convergency of a number sequence.

Recommended literature:
Seminár z matematiky. Matematika pre maturantov. Zbierka úloh s riešeniami. 1. časť. / Z. Kubáček a J. Žabka. MAPA Slovakia, 2017
Seminár z matematiky. Matematika pre maturantov. Zbierka úloh s riešeniami. 2. časť/ Z. Kubáček a J. Žabka. MAPA Slovakia, 2018
Základy matematické analýzy: 1. díl / J. Veselý. Praha: Matfyz Press, 2004
Matematická analýza pro učitele: 1. díl / J. Veselý. Praha : Matfyz Press, 1997
A First Course in Real Analysis. 2nd Ed / M.H. Protter a C. B. Morrey. Springer-Verlag, 1991

Languages necessary to complete the course:
slovak, enghlis

Notes:

The course is primarily intended for teacher training students; students of other programs can enroll in it only with the consent of their guarantor.

Past grade distribution
Total number of evaluated students: 69

A	B	C	D	E	FX
23,19	17,39	23,19	21,74	11,59	2,9

Lecturers: RNDr. Monika Dillingerová, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-101/22	Mathematical Analysis (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:
Continuous assessment: two continuous tests, at least 60% for the progress of the written part of the exam
Examination: written and oral, at least 50% success in the written test for the oral part
Assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Comprehention of basic ideas and concepts of differential calculus of functions of one real variable. After completing the course, the student can use the methods of differential calculus of functions of one variable in solving some specific, practical problems and simpler optimization problems, to create numerical estimates of quantities. Students will master more accurate methods of determining the course of the quantity, they will be able to approximate the values of functions with the values of the polynomial.

Class syllabus:
Estimates of lengths, areas and volumes, considerations using infinitesimal quantities (Kepler, Cavalieri). Introduction of real numbers. Limit of sequence, Convergence of a bounded monotonic sequence, Limits theorems. Function limits - a definition based on the concept of sequence limits. Function limit theorems. Continuity of a function , Basic properties of continuous functions at intervals. Derivation of functions, derivatives of higher orders, their applications. Mean value theorems, L´Hospital's rule.

Recommended literature:
Zbierka úloh z vyššej matematiky : 1. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1985
Zbierka úloh z vyššej matematiky : 2. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1986
Základy matematické analýzy : 1. díl / Jiří Veselý. Praha : Matfyzpress, 2004
Matematická analýza pro učitele : 1. díl / Jiří Veselý. Praha : Metafyz Press, 1997
A First Course in Real Analysis. 2nd Ed / M.H. Protter a C. B. Morrey. Springer-Verlag, 1991

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 282

A	B	C	D	E	FX
10,99	9,93	12,41	18,09	20,21	28,37

Lecturers: doc. PaedDr. Mária Slavíčková, PhD., Mgr. Michaela Vargová, PhD., Mgr. Katarína Kalužná

Last change: 17.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-105/22	Mathematical Analysis (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.KDMFI/1-UMA-101/22 - Mathematical Analysis (1)

Recommended prerequisites:
-

Course requirements:
Continuous assessment: two continuous tests, at least 60% for the progress of the written part of the exam
Examination: written and oral, at least 50% success in the written test for the oral part
Assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Understand the basic concepts and principles of the curriculum specified in the syllabus. Using the techniques of integral calculus of one variable, they will be able to apply a definite integral in the calculation of measures of geometric shapes and bodies. They will understand the principle of deriving formulas to calculate these quantities. Using the above knowledge, students will be able to find solutions to selected problems, estimate the values of some functions and important constants using infinite series.

Class syllabus:
Taylor polynomial, Antiderivatives and Definite integral, Substitution rule, Integration by parts, The elements of Riemann integral theory, The Fundamental Theorem of Calculus, Application of Integration - areas between curves, volumes, arc length, area of surface of revolution, Improper integrals, Infinite series, Absolute convergence, Rearrangements of infinite series

Recommended literature:
Zbierka úloh z vyššej matematiky : 2. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1985
Zbierka úloh z vyššej matematiky : 4. časť / Jozef Eliaš, Ján Horváth, Juraj Kajan. Bratislava : Alfa, 1986
Základy matematické analýzy : 1. díl / Jiří Veselý. Praha : Matfyzpress, 2004
Matematická analýza pro učitele : 1. díl / Jiří Veselý. Praha : Metafyz Press, 1997

A First Course in Real Analysis. Second Ed / Protter, M.H., a Morrey, C. B..Springer-Verlag, 1991

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 189

A	B	C	D	E	FX
16,4	14,29	16,4	27,51	18,52	6,88

Lecturers: doc. PaedDr. Mária Slavíčková, PhD., Mgr. Michaela Vargová, PhD., Mgr. Katarína Kalužná

Last change: 16.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-211/22	Mathematical Analysis (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: 4

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KDMFI/1-UMA-105/22 - Mathematical Analysis (2) or FMFI.KDMFI/1-UMA-101/22 - Mathematical Analysis (1)

Recommended prerequisites:
Matehematical analysis (1), Mathematical analysis (2)

Course requirements:
Continuous assessment: two continuous tests, at least 60% for the progress of the written part of the exam Examination: written and oral, at least 50% success in the written test for the oral part Assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will be able to identify the type of integral and solve the integral by a suitable method. By modeling using differential equations, they will be able to describe simpler events in nature, such as different types of growth, descent, decay, mixing of fluids, gases. Using the above knowledge, students will be able to find solutions to selected problems, estimate the values of some functions and important constants using infinite series.

Class syllabus:
Techniques of Integration (Integration of Rational Function by Partial Fractions, Trigonometric Integrals, Trigonometric Substitution), Differential Equations (Separable Differential Equations, Linear Differential Equations), Applications of Diferential Equations, Functional Sequences, Uniform Convergence of Functional Sequences, Functional Series, Uniform Convergence of Functional Series, Term by Term Differentiation and Term by Term Integration of Series, Power Series, Taylor Series

Recommended literature:
A First Course in Real Analysis. Second Ed / Protter, M.H., a Morrey, C. B. Springer-Verlag, 1991

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 119

A	B	C	D	E	FX
45,38	21,01	15,97	5,88	8,4	3,36

Lecturers: doc. PaedDr. Mária Slavíčková, PhD., Mgr. Michaela Vargová, PhD., Mgr. Jana Havlíčková, PhD.

Last change: 16.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-221/22	Mathematical Contests and Seminars (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:
Continuous assessment: Homework - individual work of students
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will deepen and expand their knowledge of selected areas of lower secondary school mathematics with an emphasis on counting tasks from mathematical Olympiads, competitions and correspondence seminars. Focus on the issue of linking higher mathematics with lower secondary school mathematics, especially for gifted pupils or pupils with an increased interest in mathematics.

Class syllabus:
Number theory. Equations, inequalities and their systems. Sequence. Planimetry. Stereometry. Combinatorics. Logic.

Recommended literature:
Vybrané úlohy z matematických olympiád : Kategoria Z : výber riešených úloh z III. až XXI. ročníka súťaže / processed by J. Vyšín, V. Macháček. Bratislava : Slovenské pedagogické nakladateľstvo., 1974
Geometrické úlohy z matematickej olympiády ZŠ / M. Dillingerová. Bratislava : Metodicko-pedagogické centrum, 2005
Jak jse jmenuje tahle knížka / R. Smullyan. Praha : Portál, 2015
Matematici, ja a ty / P. Bero. Bratislava : Mladé letá, 1989
Odborný program matematických krúžkov na II. stupni ZŠ / H. Bachratý, K. Bachratá, V. Burjan. Bratislava : PÚMB, 1986
Tasks from Mathematical Olympiad, competitions and Mathematical correspondence seminars

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 39

A	B	C	D	E	FX
76,92	15,38	2,56	0,0	5,13	0,0

Lecturers: Mgr. Emília Miťková, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-222/22	Mathematical Contests and Seminars (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:
Continuous assessment: Homework - individual work of students
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will deepen and expand their knowledge of selected areas of lower and upper secondary mathematics with an emphasis on counting tasks from mathematical Olympiads, competitions and correspondence seminars. Focus on the issue of linking higher mathematics with lower and upper secondary mathematics, especially for gifted pupils or pupils with an increased interest in mathematics.

Class syllabus:
Logic, reasoning and proof. Trigonometry. Game theory. Optimization tasks. Functions, their properties, and graphs.

Recommended literature:
Vybrané úlohy z matematických olympiád : Kategoria Z : výber riešených úloh z III. až XXI. ročníka súťaže / processed by J. Vyšín, V. Macháček. Bratislava : Slovenské pedagogické nakladateľstvo., 1974
Geometrické úlohy z matematickej olympiády ZŠ / M. Dillingerová. Bratislava : Metodicko-pedagogické centrum, 2005
Jak jse jmenuje tahle knížka / R. Smullyan. Praha : Portál, 2015
Matematici, ja a ty / P. Bero. Bratislava : Mladé letá, 1989
Odborný program matematických krúžkov na II. stupni ZŠ / H. Bachratý, K. Bachratá, V. Burjan. Bratislava : PÚMB, 1986
Tasks from Mathematical Olympiad, competitions and Mathematical correspondence seminars

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 8

A	B	C	D	E	FX
50,0	37,5	0,0	12,5	0,0	0,0

Lecturers: Mgr. Emília Miťková, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-120/15	Mathematical Methods in Physics (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: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: written exams, problem solving
Exam: written
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains min. 50% marks.

Learning outcomes:
Students know the basic mathematical concepts and methods used in the physics course. These can be used in solving basic physics course tasks.

Class syllabus:
Vector and basic vector operations. Scalar and vector product. Function and its properties. Derivation of a function. The course of the function. Differential. Taylor polynomial. Application of differential calculus. Indefinite integral. Integration methods. Definite integral. Applications of a definite integral. Improper integral. 1st and 2nd order linear differential equations. 1st order and 2nd order differential equations. Differential equations in physics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 108

A	B	C	D	E	FX
48,15	21,3	8,33	5,56	5,56	11,11

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-121/15	Mathematical Methods in Physics (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: 2.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: tests (3x20 marks), problem solving (4x10 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will be awarded if the student obtains min. 50% marks.

Learning outcomes:
Graduates master selected mathematical concepts and methods used in physics and know how to use them in solving core physics courses.

Class syllabus:
Real function of several variables. Points and sets in n-dimensional space. Limit functions of several variables. Continuity of a function of several variables. Partial derivatives of functions of several variables. Complete differential of a function of several variables. Taylor polynomial functions of several variables. Extremes of functions of several variables. Local extremes of functions of several variables. Bound local extremes. Global (absolute) extremes. Integral of functions of several variables. Calculation of a certain integral on an interval. Integral calculation on the elementary domain. Substitution method for integrals of several variables (polar, cylindrical and spherical coordinates). Geometric applications of integral of several variables. Applications of plural integrals in physics. Scalar and vector fields. Gradient, divergence, rotation. Curve integrals of the 1st and 2nd kind.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 82

A	B	C	D	E	FX
59,76	15,85	9,76	9,76	1,22	3,66

Lecturers: doc. PaedDr. Klára Velmovská, PhD.
Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-111/15	Mechanics

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: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: papers. homeworks
Exam: written
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
Students will understand the basic concepts and laws of mechanics and will be able to use them in solving problems.

Class syllabus:
Basic physical quantities. Gradual movement, movement in a circle. Newton's laws of dynamics, force, momentum. Inertial and non-inertial reference frames. Gravitational field. Work, kinetic and potential energy, moment of force, moment of momentum. Conservation laws in mechanics. Rigid body mechanics, center of gravity, moment of inertia, Steiner's theorem, rotational motion. Fluid mechanics. Oscillations - free, damped and forced, resonance.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 117

A	B	C	D	E	FX
28,21	18,8	17,95	14,53	5,13	15,38

Lecturers: PaedDr. Peter Horváth, PhD., doc. RNDr. Peter Demkanin, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-138/22	Modern Teacher Software

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: 2.

Educational level: I.

Prerequisites: FMFI.KDMFI/1-UXX-137/22 - Digital Literacy

Course requirements:
Continuous assessment: project - course website (25%), assignments (75%)
Indicative grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be able to assess what activities teachers do and how digital technology can help them do this.
They are familiar with digital tools for creating attractive educational materials and have their own experience with them. They are able to use digital tools to create learning materials that focus on discovery learning where the activity is in the hands of the learner.
They are familiar with frequently used complex learning management systems (LMS). They are able to evaluate the strengths and weaknesses of using an LMS for specific activities of teaching practice and are familiar with alternative software that allows some of these activities to be carried out more efficiently.
They are able to create their own website and add different forms of content to it.
They are able to reflect on the use of specific digital tools in their future teaching. They are able to find the appropriate digital tools for a given activity, analyse them and, based on this analysis, choose among competing tools the one that additionally meets their needs.

Class syllabus:
Students work on a variety of topics using digital technologies and assess how they perceive their potential in their teaching practice. They publish the products of their work along with a reflection on the topic on their website.
The topics they are working on include:
The use of digital tools in the classroom
Creating your own digital learning materials
Working with graphics, photo editing, creating animations
Working with video
Working with sound
Learning management systems

Creating mind maps

Recommended literature:
Design of digital educational environment / Michal Černý. Brno: Flow, 2020.
own electronic texts published on the website, resp. in the Moodle environment

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 197

A	B	C	D	E	FX
74,62	12,69	6,09	1,02	2,03	3,55

Lecturers: Mgr. Mária Čujdíková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-342/15	Molecular Physics and Thermodynamics

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: 3

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: tests (2x10 marks), presentation of individual project work (10 marks), homeworks (3x10 marks)
Exam: written (40 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
Graduates will have basic knowledge of molecular physics and thermodynamics - basic concepts, methods, laws and selected applications in this field. They will have an idea of the boundaries between graduation and university physics in this area in terms of working with high school youth with an increased interest in physics. They will have developed skills and knowledge to work with energy transformations and the law of conservation of energy within classical physics.

Class syllabus:
History of molecular discovery, Mol, Avogadro's constant, typical dimensions of the microworld. Phenomenology of gas processes, equation of state, Kelvin scale. Kinetic theory of gas pressure, the relationship between temperature, heat and energy. Macroscopic work of gas, heat as microscopic work, the first thermodynamic theorem. Mayer's relationship, Adiabatic story. Continuous random variables. Maxwell's velocity distribution. Boltzmann distribution and barometric formula. A synthesizing view of the law of conservation of energy in classical physics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 80

A	B	C	D	E	FX
68,75	17,5	5,0	2,5	1,25	5,0

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 202

A	B	C	D	E	FX
89,6	1,49	1,49	0,0	2,97	4,46

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 202

A	B	C	D	E	FX
89,6	1,49	1,49	0,0	2,97	4,46

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-UXX-231/22	Pedagogic Communication

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

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI-Prif.KDPP/1-UXX-231/10

Course requirements:
The course is completed by assessment, the ratio of interim/final assessment is 80/20. The condition for successful completion of the course is obtaining at least 60 % of the maximum possible course grade. Assignments during the semester in the form of micro-assignments, model communication situations, student-designed and recorded video sequences, analysis of recordings, and an emphasis on strengthening communication competencies and skills will be assessed.
Assessment will be given on a scale:
A: 93-100%, excellent - outstanding results,
B: 85-92%, very good - above average standard,
C: 76-84%, good - normal reliable work,
D: 68-75%, satisfactory - acceptable results,
E: 60-67%, satisfactory - results meet minimum criteria,
Fx: 0-59%, inadequate - extra work required
Translated with www.DeepL.com/Translator (free version)
Scale of assessment (preliminary/final): 80/20

Learning outcomes:
Upon successful completion of the course, students have knowledge of the principles of effective pedagogical communication. They are able to analyze communication episodes, identify problematic communication aspects and create communication opportunities and learning environments that promote student participation in the classroom. They understand the importance and methods of managing pedagogical communication in school classrooms. They can anticipate and respond appropriately to a variety of communication situations. Through the implementation of micro-outcomes and other forms of training in effective pedagogical communication, they are able to apply the acquired theoretical knowledge in the practice of primary and secondary schools.

Class syllabus:
Insights into the phylogenetic and ontogenetic aspects of interpersonal communication, social communication, interaction.

Communication styles, communication competences and skills of future teachers, their practice and strengthening.
Pedagogical communication -functions, planes, ways, components, directions, effectiveness, basic rules, organizational forms of pedagogical communication, non-verbal (extralinguistic means and paralinguistic aspects of speech) and verbal (written and oral) communication in the school classroom, teacher management of communication (questions, feedback), pupil participation in communication, persuasion, argumentation, criticism, school language, IRF/IRE structure, communication by action in the classroom, space in communication, methods of investigating pedagogical communication.
Types of conflict in school settings, strategies and methods of conflict resolution.
Errors in pedagogical communication. Humour in the school classroom.
Intergenerational communication in education.

Recommended literature:

BARKER, A. 2020. Zlepšete své komunikační schopnosti. Lingea.
GAVORA, P. 2007. Učiteľ a žiaci v komunikácii. Bratislava : UK.
HALÁKOVÁ, Z. 2012. Pedagogická komunikácia. 1. vyd., Bratislava : Univerzita Komenského.
MAREŠ, J., KŘIVOHLAVÝ, I. 1995. Komunikace ve škole. Brno : Masarykova univerzita.
MIKULÁŠTÍK, M. 2003. Komunikační dovednosti v praxi. Praha : Grada Publishing.
NELEŠOVSKÁ, A. 2005. Pedagogická komunikace v teorii a praxi. Praha : Grada.
PECH, J. 2009. Řeč těla a umění komunikace. Praha : NS Svoboda.
ŠEĎOVÁ, K. 2013. Humor ve škole. Brno : Masarykova univerzita.
ŠEĎOVÁ, K. a kol. 2019. Výuková komunikace. Brno: Masarykova univerzita.
ŠEĎOVÁ, K., ŠVAŘÍČEK, R., ŠALAMOUNOVÁ Z. 2012. Komunikace ve školní třídě. Praha : Portál.
ŠTĚPANÍK, J. 2005. Umění jednat s lidmi 2. Komunikace. Praha : Grada.
VYBÍRAL, Z. a kol. 2009. Psychologie komunikace. Praha : Portál.
aktuálne články a štúdie

Languages necessary to complete the course:
Slovak, Czech

Notes:

Past grade distribution
Total number of evaluated students: 145

A	B	C	D	E	FX
83,45	7,59	2,07	2,07	2,07	2,76

Lecturers: doc. RNDr. Martin Takáč, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-143/22	Pedagogical Interviews

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: 1.

Educational level: I.

Prerequisites:

Course requirements:
active participation in classes (discussion, presentation of opinions, ...) (80%),
homeworks (reading texts, preparation of essays and presentations ...) (20%)
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student:
- begins to think about education from the teacher's point of view.
- is able to discuss personal and educational challenges in the teaching profession.
- will be able to identify, compare and express a constructive opinion on the current state of the school in the context of modern concepts of education.
- will perceive the potential of the teaching profession to positively influence the quality of life of its students.

Class syllabus:
Course contents:
- from student to teacher
- vision of modern education
- the teacher as a positive role model
- creativity in professional subjects
- a school where students enjoy
- personal development
- how to burn and not burn
- a school for everyone

Recommended literature:
own electronic texts published on the website, resp. in the Moodle environment
JANÍK, T .: Myths of False Error. About chibas in education and pedagogy. Masaryk University. 2020.
ČOKYNA, J .: And where are your edges? N Press. 2019

KUBÍKOVÁ, S .: Klub nezbitných detí. Seven things that will help your children survive in modern times. Diary Postoj 2018.
JANÍK, T .: Lessons from pedagogy: Everything for education. Ammunition 2021

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
66,67	14,81	7,41	7,41	3,7	0,0

Lecturers: prof. RNDr. Ivan Kalaš, PhD., doc. Mgr. Karolína Miková, PhD., Mgr. Lucia Budinská, PhD., PaedDr. Mgr. Natália Kováčová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 7493

A	B	C	D	E	FX
92,81	1,52	0,23	0,0	0,08	5,37

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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová
Last change: 16.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 5850

A	B	C	D	E	FX
95,61	1,5	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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová
Last change: 15.03.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 3440

A	B	C	D	E	FX
98,14	0,44	0,09	0,03	0,0	1,31

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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová

Last change: 16.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 2957

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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 2264

A	B	C	D	E	FX
98,63	0,35	0,09	0,0	0,0	0,93

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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 205

A	B	C	D	E	FX
94,63	0,49	0,49	0,0	0,0	4,39

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, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-UFY-951/15	**Course title:** Physics and Didactics of Physics
Number of credits: 2	
Educational level: I.	

Course requirements:

The final examination is realized by the student's discussion with the members of the commission on two topics from the content of the examination. Assessed: illustration of concepts on suitable examples / contexts / situations 0-3 points; correctness of physics terminology 0-3 points; intelligibility of discussion 0-3 points; responding to commission questions regarding selected topics 0-3 points; responding to other commission questions / broader context 0-3 points. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%

The exam is successfully passed if the student obtains at least 50% of points.

Learning outcomes:

Passing the exam represents fulfilling the profile of the graduate.

Class syllabus:

Physics:

Movement in two dimensions. Even movement in a circle. Movements in a homogeneous gravitational field, oblique litter. Newton's laws of motion. Relationship between free fall and motion of bodies in the radial field of the Earth.

Mechanical work, kinetic energy, work of gravitational force (in homogeneous gravitational field), work of elastic force, power, potential gravitational energy, potential energy of elasticity, law of conservation of mechanical energy, conservative and non-conservative forces, work of friction force.

Fluid mechanics, pressure, compressive force, pressure induced by fluid gravity, Archimedes' law, Pascal's law, continuity equation, Bernoulli's equation.

Elastic and inelastic collisions, momentum, impulse of force, law of conservation of system momentum, elastic and inelastic direct collisions, oblique collisions, explosion (in two parts).

Moment of force with respect to the axis of rotation, momentum of the moment for rotation around a fixed axis (second impulse theorem), rolling, rotation of bodies around a fixed axis, rolling on an inclined plane. Momentum, momentum of a particle system, momentum of a rigid body with respect to a fixed axis, the law of conservation of momentum.

Coulomb's law. Electric field. Scalar and vector fields. Electric fields, lines of force. Point charge field. Superposition of electric fields. Electric dipole field. Application of Gauss' s law.

Electric potential. Electric potential energy. Potential, voltage, equipotential surfaces. Electron volt. Work performed by an external force when moving the charge in the el. field. Point charge potential. Potential energy and potential of a system of point charges. Faraday's cage. Capacity. Capacitor and capacity. Capacitor charging process.

Circuits with unidirectional el. current. Electromotive voltage. Internal battery resistance, terminal voltage. Battery power, power dissipation, battery charging and discharging. Loop rule, node rule, current calculation in resistor circuits by voltage method. Serial and parallel connection of resistors. Connection of ammeters and voltmeters, ideal ammeter and ideal voltmeter.

Magnetic field. The essence of magnetism and the magnetic field, the absence of a magnetic monopole. Magnetic induction, Lorentz force. Induction lines. Bar magnet. The trajectory of a charged particle in mag. field. Earth's magnetic field, aurora borealis. Cyclotron and synchrotron. Charged particle separator according to velocities, mass spectrometer. Hall map. Force acting on a current conductor in a magnetic field (Ampere's force).
Electromagnetic induction. Induced current, induced electromotive voltage. Experiments demonstrating electromagnetic induction. Faraday's law of electromagnetic induction. Lenz's law. Induction energy transfer. Alternator. Faraday's law of electromagnetic induction in integral form. Eddy currents.
Electromagnetic oscillations and alternating current circuits. LC oscillations, energy transfer, energy conservation, mechanical analogy. Damped oscillations in a serial RLC circuit. Circular frequency of undamped and damped oscillations. Power in RLC circuit with AC source. Effective voltage, power factor, resonant frequency of the source.
Mechanical vibration, kinematics - instantaneous deflection, speed and acceleration of oscillating motion, equation of motion for harmonic motion, energy of harmonic oscillator. Torsional oscillations, mathematical and physical pendulum, damped and forced oscillations, resonance.
Waves, superposition principle, wave speed propagating on a rope, reflection and transmission of a wave at an interface, standing waves, sound, resonance in tubes, Doppler effect, sound shock waves. Doppler phenomenon in connection with sound and in connection with light. Body velocity measurement. Infrared shift when exploring distant stars.
Electromagnetic waves, light, spectral regions of light and electromagnetic waves, Interference in space, basic assumptions of two-beam interference, Young's two-slit experiment, intensity profile in interference, interference on thin films. Sound wave interference. Bending (diffraction) of light at the aperture, Rayleigh criterion, diffraction grating.
Rutherford scattering, Bohr model of the atom, electron transitions between energy levels, emission and absorption spectra of gases. Franck-Hertz experiment. X-rays.
Interaction and radiation detection. Photoelectric effect, Compton scattering, pair formation and annihilation.
The nucleus of an atom and its properties. Weight loss and binding energy. nuclear fusion and fission. Isotopes.
Radioactive transformation. Alpha, beta and gamma radiation. Law of radioactive transformation, activity. Absorption characteristics of alpha, beta and gamma rays.
Ideas about the microworld. Basic substance characteristics (molar quantities). Equation of state of an ideal gas. Heat and temperature, Kelvin temperature scale. Thermal processes with an ideal gas - state changes and energy aspects. Ideal gas pressure, barometric equation. Kinetic theory of substance structure. Maxwell-Boltzmann distribution. The law of conservation of energy in terms of thermodynamics.
Didactics:
Science literacy, scientific work skills. Examples of the development of scientific skills in teaching physics.
Objectives and content of science and physical education.
Bloom's taxonomy of goals and its application in the creation of physical problems.
Basic pedagogical documents and teaching aids, their structure and function.
The model of ontogenesis of thinking according to J. Piaget and its importance for the creation of the physics curriculum.
Empirical and theoretical cognition in school physics. Selected methods of access to methods and ways of cognition.
Graphic method of communication between two quantities. Examples of the use of graphs in the introduction of some physical concepts.

Classification of physical tasks. The importance of the physical role in the cognitive process.
Complex physical problems, function of complex tasks in introducing ideas about natural phenomena.
Complete scheme of the school physics experiment planned by the teacher - the teacher's activity.
Pupil's activity in various phases of planning, implementation and data processing of a school physics experiment. Pupil-planned experiment.
Classification of school physics experiments (cognitive functions, organization, means used, data obtained).
Assessment and classification of students in physics teaching. Assessment of the degree of development of students' scientific abilities.
Key experiments on the topic of "fluid statics".
Key experiments on the topic of "calorimetry".
Key experiments on the topic of "molecular physics".
Key experiments on the topic of "movement and force".

State exam syllabus:

Recommended literature:
Recommended literature on the subjects of the study program.

Languages necessary to complete the course:
Slovak and English.

Last change: 10.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-360/15	Physics as the Component of Science Education

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.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: seminar work (30 marks), defence of seminar work (40 marks), discussion of the work of peers (30 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
They will know the ways of integration of science subjects into didactic programs and the position of physics in them, common methods, procedures, strategies and concepts in science subjects.

Class syllabus:
New approaches to the transformation of natural sciences into didactic models of education. Physics as a basis of conceptual structure and methods of work in the didactic model of science education. Graphical method of imaging as a way of mathematical modeling of phenomena. Application of historical aspects in the content of education.
Investigation of the properties of liquids and gases - a starting point for mastering the methods of measuring weight, length, volume. Procedures and strategies for experimental activities, as well as processing of measured data. Application of selected methods of work in physics to the study of living organisms.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 53

A	B	C	D	E	FX
75,47	13,21	7,55	0,0	0,0	3,77

Lecturers: doc. PaedDr. Viera Haverlíková, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-170/20	Physics by Experience

Educational activities:
Type of activities: training session
Number of hours:
per week: **per level/semester:** 5d
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3., 5.

Educational level: I.

Prerequisites:

Course requirements:
During the camp, students will solve short practical tasks (3x10 marks) and one project task (40 marks). Reflection of the camp activities is for max. 30 marks.
Rating A = (90, 100]%, B = (80, 90]%, C = (70, 80]%, D: (60, 70]%, E: (50, 60]%).
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
By completing the course, the student will gain basic knowledge about the specifics of teaching physics in the outdoor environment. At a level appropriate to the future beginning physics teacher, will know the main characteristics of non-formal education and will be able to use selected methods of non-formal education in teaching physics at secondary schools.

Class syllabus:
The outdoor environment as a part of the environment for elementary school students' learning. Formal, non - formal and informal learning. Edutainment. Situation analysis - condition analysis, environment analysis and needs analysis. Objectives of non-formal education - knowledge, skills, attitudes, relationships. Methods and techniques in non-formal education. Creative-discovery workshops. Educational games. Group dynamics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 31

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

Lecturers: doc. PaedDr. Viera Haverlíková, PhD., doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-144/22	Probability Measure and Mathematical Statistics (0)

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:
Continuous assessment: continuous paper
Final evaluation: creating a portfolio of tasks and their solutions
Indicative assessment scale: A 94%, B 86%, C 79%, D 70%, E 60%, Fx <60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Gaining a comprehensive view of the basic concepts and principles of probability and statistics and the ability to apply knowledge in this area in solving problems.

Class syllabus:
1. Basic concepts of probability and related tasks (random events, probability, complementary probability, independent events, certain event, impossible event).
2. Geometric probability and related problems.
3. Combinatorial probability and related problems. Bernoulli's scheme.
4. Conditional probability.
5. Basic concepts of statistics: averages - arithmetic, weighted, geometric, harmonic, modus, median, standard deviation.

Recommended literature:
Matematika pre 4. ročník gymnázií a 8. ročník gymnázií s osemročným štúdiom. / Kubáček, Z. Bratislava : Orbis Pictus Istropolitana, 2013
Matematika pre 3. ročník gymnázií a 7. ročník gymnázií s osemročným štúdiom (1. časť). / Kubáček, Z. Bratislava : Orbis Pictus Istropolitana, 2010
Matematika a svet okolo nás. / Kubáček, Z., Černek, P., Žabka, J. Bratislava: PACI, 2008
Ako sa počíta pravdepodobnosť? / Bachratý, H., Grendár, M. a Bachratá, K. Žilina : Žilinská univerzita, 2010
Matematika náhody. / Anděl, J. Praha : Matfyzpress, 2000

Languages necessary to complete the course:
slovak, enghlish

Notes:
The course is primarily intended for teacher training students; students of other programs can enroll in it only with the consent of their guarantor.

Past grade distribution
Total number of evaluated students: 74

A	B	C	D	E	FX
41,89	36,49	9,46	5,41	2,7	4,05

Lecturers: doc. PaedDr. Peter Vankúš, PhD.

Last change: 14.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-UMA-302/22	Probability Measure and Mathematical Statistics (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: 5.

Educational level: I.

Prerequisites:

Course requirements:
Preliminary evaluation: papers during the semester (40%)
Final exam: project (30%) and oral exam (30%)
Rating scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course, students will acquire classical probabilistic methods, axiomatic probability approach, will be able to work with discrete and continuous random variables and apply them to solve various problems. They will learn some statistical procedures and will be able to make point and interval estimators.

Class syllabus:
Basic concepts of probability, classical, geometric and axiomatic definition of probability. Conditional probability, Bayes' theorem, independence of random events, Bernoulli's scheme. Continuous and discrete random variables. Distribution function and its properties, numerical characteristics. Normal distribution and central limit theorem.
Descriptive statistics. Random sample, sample characteristics, random sample from normal distribution. Point estimation, maximum likelihood method. Interval estimates for mean and variance. Hypothesis testing.

Recommended literature:
Pravdepodobnosť a štatistika / K. Janková, A. Pázman. Bratislava : Univerzita Komenského, 2011
Zbierka úloh zo základov teórie pravdepodobnosti / R. Harman, E. Hönschová, J. Somorčík. Bratislava : PACI, 2009
Štatistika zrozumiteľne / J. Somorčík, I. Teplička. Nitra : Enigma, 2015
Introduction to probability models / S. M. Ross. Academic Press, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 220

A	B	C	D	E	FX
27,27	21,82	16,82	13,18	13,18	7,73

Lecturers: Mgr. Lívia Rosová, PhD., doc. Mgr. Lenka Filová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-UMA-309/22	Probability Measure and Mathematical Statistics (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: 4

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KAMŠ/1-UMA-302/22 - Probability Measure and Mathematical Statistics (1)

Course requirements:
Preliminary evaluation: papers during the semester (40%)
Final exam: project (30%) and oral exam (30%)
Rating scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be able to work with multidimensional distributions of discrete and continuous type. They will be able to apply the obtained probability theory to selected statistical problems of parameter estimation and hypothesis testing. They will be able to solve simple correlation and regression analysis problems.

Class syllabus:
Random vectors and their characteristics. Marginal and conditional distributions and densities. Multidimensional normal distribution and its properties. Statistical inference, parameter estimation, maximum likelihood and moment method, correlation coefficient. Statistical hypothesis testing, one-sample and two-sample tests. Regression models and least squares method. Goodness of fit tests.

Recommended literature:
Pravdepodobnosť a štatistika / K. Janková, A. Pázman. Bratislava : Univerzita Komenského, 2011
Zbierka úloh zo základov teórie pravdepodobnosti / R. Harman, E. Hönschová, J. Somorčík. Bratislava : PACI, 2009
Štatistika zrozumiteľne / J. Somorčík, I. Tepličká. Nitra : Enigma, 2015
Introduction to probability models / S. M. Ross. Academic Press, 2010

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 133

A	B	C	D	E	FX
35,34	29,32	12,03	10,53	9,77	3,01

Lecturers: doc. Mgr. Lenka Filová, PhD., Mgr. Lívia Rosová, PhD.

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KDPP/1-UXX-141/22	Psychology for Teachers (1)

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

Number of credits: 4

Recommended semester: 1.

Educational level: I., II., N

Prerequisites:

Antirequisites: FMFI-PriF.KDPP/1-UXX-131/10

Course requirements:
The course is completed by an exam, the evaluation ratio is 50% of the continuous evaluation + 50% of the final evaluation. Interim evaluation includes a midterm test (30% of evaluation) and a seminar paper (20% of evaluation). The final evaluation includes the final exam (50% of the evaluation).
To successfully complete the course, it is necessary to obtain at least 60% of points.
The rating is given on a scale:
A (100-92%, excellent - excellent results),
B (91-84%, very good - above average standard),
C (83-76%, good - normal reliable work),
D (75-68%, satisfactory - acceptable results),
E (67-60%, sufficient - results meet minimum criteria),
Fx (59-0%, insufficient - additional work required)
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The aim of the course Psychology for Teachers 1 is to make basic information about the general laws of human experience and behavior so that they can provide a platform for understanding the functioning of the human psyche and synthesize psychological knowledge, facts, theories, research approaches to a comprehensive view of the individual's psyche for creative professional application. in pedagogical practice. After completing the course, the student is able to orientate in the terminology of general and developmental psychology, can apply the knowledge of general and developmental psychology in the educational context, knows the laws of psychology, especially with regard to the needs of lower and upper secondary education, knows the laws of cognitive processes and their application in the educational process.

Class syllabus:

1. Introduction to psychology: psychology as a science, the subject of psychological research, approaches in psychology, the importance and use of psychology in the school environment and in the work of teachers.
2. Research and research methods in psychology: the importance of scientific knowledge, features of scientific work and methodology of psychological research.
3. Research and definition of mental processes. Mental and cognitive processes. Cognitive processes in the developmental and educational context in the school environment
a. perception, current research and its applications in the school environment. Interpretation and distortions in connection with the perception of the teacher.
b. Attention processes. Attention concentration, switching, current approaches. Multitasking and attention in the context of school performance and success.
c. Memory processes. Basic models of memory and their relation to education. Elaboration as a tool for effective remembering. Interference. Memory as an ability.
4. Representation and organization of knowledge, thinking: characteristics of thinking and its types. Terms: their connection and learning. Judgment and decision making. Fixed and growth-oriented mind settings. Problem solving: types of problems, problem solving strategies.
5. Intelligence: theory of intelligence, measurement of intelligence. Stability and development of intellectual abilities in relation to education. Intellectual talent.
6. Introduction to developmental psychology. Basic concepts, subject of research and methods of developmental psychology.
7. Mental development in general - determinants of development, character and types of developmental changes, characteristics of development from a psychological point of view, critical periods in development.
8. Selected developmental theories I.
9. Selected developmental theories II.
10. Periodization of development and characteristics of individual development periods I. with emphasis on the period of school age
11. Periodization of development and characteristics of individual development periods II. with an emphasis on adolescence
12. Basics of developmental psychopathology.

Recommended literature:

ATKINSON, R.C. et al. (2003) Psychology. Prague: Portal.
FONTANA, D. (1997) Psychology in school practice. Prague: Protal.
HORT, V. et al. (2008) Child and adolescent psychiatry. Prague: Portal
HOLEČEK, V. (2014) Psychology in teaching practice. Prague: City.
LANGMEIER, J.-KREJČÍŘOVÁ, D. (2006). Developmental Psychology. City.
STERNBERG, R., J. (2009). Cognitive psychology. Portal.
VÁGNEROVÁ, M. (2000) Developmental psychology. Childhood, adulthood, old age. Prague: Portal.
VESELSKÝ, M. (2001) Educational Psychology 1. Theory and practice. Bratislava: Comenius University.
VESELSKÝ, M. (2005) Educational Psychology 2. Theory and practice. Bratislava: Comenius University.

Languages necessary to complete the course:

Slovak and Czech language, English language (text comprehension)

Notes:

Past grade distribution
Total number of evaluated students: 697

A	B	C	D	E	FX
22,96	16,5	23,53	17,36	15,64	4,02

Lecturers: Mgr. Eva Paulisová, PhD., PhDr. ThLic. Peter Ikhardt, PhD., RNDr. Jana Ciceková, PhD.

Last change: 16.09.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-Prif.KDDP/1-UXX-142/22	Psychology for Teachers (2)

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

Number of credits: 4

Recommended semester: 2.

Educational level: I., II., N

Prerequisites: FMFI-PriF.KDPP/1-UXX-141/22 - Psychology for Teachers (1)

Antirequisites: FMFI-PriF.KDPP/1-UXX-135/10

Course requirements:
The course is completed by an exam, the evaluation ratio is 50% of the continuous evaluation + 50% of the final evaluation.
Continuous assessment includes active participation in seminars (at least 80% of the teaching part), presentation of the selected topic (20%) and elaboration of an essay (30%). Completion of these assignments is a condition of admission to the final exam.
The final evaluation includes the final exam (50% of the evaluation).
To successfully complete the course, it is necessary to obtain at least 60% of points.
The rating is given on a scale:
A (100-92%, excellent - excellent results),
B (91-84%, very good - above average standard),
C (83-76%, good - normal reliable work),
D (75-68%, satisfactory - acceptable results),
E (68-60%, sufficient - results meet minimum criteria),
Fx (59-0%, insufficient - additional work required)
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The aim of the course Psychology for Teachers 2 is to make available the knowledge of personality psychology and educational psychology so that they can form the basis for understanding the functioning of the human psyche and synthesize psychological knowledge and theories into a comprehensive view of the individual's psyche for creative professional application in pedagogical practice. The aim of the course is also to increase the sensitivity of students to interindividual diversity in the school environment, to develop their psychological literacy and ability to apply current knowledge of theoretical and applied psychological disciplines in educational practice. After completing the course, the student is able to orientate in the terminology of personality psychology and educational psychology and can use the knowledge from these disciplines in designing an educational unit, knows the psychological context of the educational process.

Class syllabus:

1. Personality psychology and interindividual differences. Understanding personality in psychology. Application of personality psychology in pedagogical practice.
2. Biological and social bases of personality. Personality structure - temperament, character, abilities, motivation.
3. Personality typologies and their importance in educational practice. Personality of the teacher.
4. Psychology of learning - types, laws and conditions of learning. Selected approaches and theories of learning.
5. Psychological issues of motivation in the field of education. Resources and factors influencing motivation. Types of motivation. Selected theories of motivation. Performance motivation, goals and self-regulation.
6. Creativity in education - conditions and models of creative learning. Increasing creativity in students.
7. Pupils' performance in the educational process. School success vs. failure, failure of students. Psychological testing of students. Test and pre-test conditions. Evaluation and self-evaluation.
8. Psychosocial climate and class / school atmosphere as a factor of optimal education. Classroom communication. Class engagement and teacher influence. School classroom management and administration.
9. School class as a social group, the position of the individual - the student in it.
10. Learning disabilities. Pupils' problems in survival and behavior. Emotionality, self-image and aggression in the school environment. Psychological aspects of school inclusion. The role of the school psychologist and his help to the school.
11. Positive psychology in the school environment. Empathy and prosocial behavior in the classroom. Emotions in education and their importance. Active participation, interest, commitment, curiosity.
12. Personality in difficult life situations. Stress management. Load resistance. Mental health and psychohygiene at school. Prevention of bullying, mobbying and burnout.

Recommended literature:

ATKINSON, R.C. et al. (2003) Psychology. Prague: Portal.
ČÁP, P. & MAREŠ, J. (2001) Psychology for Teachers. Prague: Portal.
FONTANA, D. (1997) Psychology in school practice. Prague: Protal.
HOLEČEK, V. (2014) Psychology in teaching practice. Prague: City.
VÁGNEROVÁ, M. (2005). School counseling psychology for teachers. Prague: Karolinum
VÁGNEROVÁ, M. (2010). Personality psychology. Prague: Karolinum
VENDEL, S. (2007). Educational psychology. Bratislava: Epos
VESELSKÝ, M. (2001) Educational Psychology 1. Theory and practice. Bratislava: Comenius University.
VESELSKÝ, M. (2005) Educational Psychology 2. Theory and practice. Bratislava: Comenius University.

Languages necessary to complete the course:

Slovak and Czech language, English language (text comprehension)

Notes:

Past grade distribution

Total number of evaluated students: 524

A	B	C	D	E	FX
30,53	20,8	19,47	17,56	8,59	3,05

Lecturers: Mgr. Eva Paulisová, PhD., RNDr. Jana Ciceková, PhD.
Last change: 16.09.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/1-UMA-131/22	Revision of Advanced Secondary-school Mathematics

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:

Antirequisites: FMFI.KAG/1-KXX-007/20 and FMFI.KAG/1-KXX-017/20 and PriF-FMFI.KAG/N-bCXX-002/20 and PriF-FMFI.KAG/C-bCXX-010/20

Course requirements:
Ongoing evaluation: 2 written exams
Indicative rating scale: A 91%, B 81%, C 71%, D 61%, E 51%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students will master the apparatus of high school mathematics (basics of logic, basic concepts of set theory, the concept of function) at the level required to study some parts of university mathematics.

Class syllabus:
Logic and sets, basic types of proofs. Functions and their basic properties. Linear and quadratic function.

Recommended literature:
Matematika pre 1. ročník gymnázií : 1. časť / Zbyněk Kubáček. Bratislava : Slovenské pedagogické nakladateľstvo, 2009
Matematika pre 1. ročník gymnázií : 2. časť / Zbyněk Kubáček. Bratislava : Slovenské pedagogické nakladateľstvo, 2010
Matematika pre druhý ročník gymnázií : 1. časť / Zbyněk Kubáček. Bratislava : Orbis Pictus Istropolitana, 2009
Matematika pre 2. ročník gymnázií a 6. ročník gymnázií s osemročným štúdiom : 2. časť / Zbyněk Kubáček. Bratislava : Orbis Pictus Istropolitana, 2010
Nová maturita : Matematika : Interná časť - ústna skúška / Pavol Černek, Zbyněk Kubáček. Bratislava : Slovenské pedagogické nakladateľstvo, 2005
Matematika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom : 1. časť / Zbyněk Kubáček. Bratislava : Slovenské pedagogické nakladateľstvo, 2012

Matematika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom : 2. časť / Zbyněk Kubáček. Bratislava : Slovenské pedagogické nakladateľstvo, 2013
Matematika : 1 : zbierka úloh pre stredné školy / Iveta Kohanová ... [et al.]. Bratislava : Orbis Pictus Istropolitana, 2011
Seminár z matematiky : 1. časť / Zbyněk Kubáček, Ján Žabka. Bratislava - Mapa Slovakia, 2017

Languages necessary to complete the course:
Slovak, English

Notes:
The course is primarily intended for teacher training students; students of other programs can enroll in it only with the consent of their guarantor.

Past grade distribution
Total number of evaluated students: 339

A	B	C	D	E	FX
20,94	18,58	15,63	19,47	18,29	7,08

Lecturers: doc. RNDr. Zbyněk Kubáček, CSc., doc. PaedDr. Peter Vankúš, PhD.

Last change: 24.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UIN-354/22	Robotic Kits as Pedagogical Tools

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:

Course requirements:
Evaluation during semester: active participation, work on project during lessons (100%)
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student:
- try out the implementation of activities for primary school students
- get acquainted with several robotic toys
- discuss the possible use of robotic toys in various subjects at school;
- get acquainted with project teaching and constructionist form of teaching and will be able to apply the basic principles of these forms in educational activities with robotic toys
- will independently design, solve and present robotic projects

Class syllabus:
- simulation of an inexperienced teacher
- acquaintance with new technology
- analysis of the control tool
- work with methodical materials
- creative activities with a selected robotic toy
- didactic view of robotic toys
- presenting findings and learning feedback

Recommended literature:
- Further education of primary and secondary school teachers in the subject of informatics: Didactics of robotic building blocks: 1.2 Education of unqualified informatics teachers at the 2nd level of primary school and at secondary school / Martina Kabátová, ... [et al.]. Bratislava: State Pedagogical Institute, 2010
- Transformations of the school in the digital age / Ivan Kalaš a kolektív. Bratislava: Slovenské pedagogické nakladateľstvo - Mladé letá, 2013
-Getting Started with LEGO Robotics: A Guide for K-12 Educators / Mark gura. International Society for Technology in Education.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 194

A	B	C	D	E	FX
92,78	3,09	1,03	0,52	0,0	2,58

Lecturers: doc. Mgr. Karolína Miková, PhD., Mgr. Jakub Krcho

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 746

A	B	C	D	E	FX
57,77	16,62	11,13	4,16	1,74	8,58

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 215

A	B	C	D	E	FX
68,84	17,67	9,3	2,33	0,0	1,86

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-320/15	School Experiments in Physics

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: 3

Recommended semester: 5.

Educational level: I., N

Prerequisites:

Course requirements:
Continuous assessment: tests (2x15 marks), assessment of individual work (2x15 marks)
Exam: practical (20 marks), written (20 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
Students will gain an overview of selected experiments conducted at secondary school. They will be able to carry out the experiments independently, explain them from a physics point of view and include them appropriately in the process of physics and science education.

Class syllabus:
Safety in the school laboratory. Demonstration experiments, frontal, work of students in a group. Experiments on the properties of substances, fluid statics, calorimetry, molecular physics, fluid dynamics, statics and dynamics of a rigid body, work, power, energy, kinematics, motion and force.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 85

A	B	C	D	E	FX
51,76	23,53	17,65	2,35	3,53	1,18

Lecturers: doc. PaedDr. Klára Velmovská, PhD., Mgr. Aneta Kolodzejová, RNDr. Kristína Rostás, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-331/22	School Management

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

Number of credits: 3

Recommended semester: 6.

Educational level: I., II., N

Prerequisites:

Antirequisites: FMFI-Prif.KDPP/1-UXX-331/15

Course requirements:
The condition for successful completion of the course is to obtain at least 60% of the maximum possible evaluation of the course.
The work during the semester on partial tasks from different areas and levels of school management will be evaluated:
- reading and presentation of recommended literature (10%)
- active participation in exercises (35%)
- attendance at lectures and feedback on lectures (20%)
- report+presentation in pairs (15%)
- final written exam (20%)

The rating is given on a scale:
A: 93-100%, excellent - excellent results,
B: 85-92%, very good - above average standard,
C: 76-84%, good - normal reliable work,
D: 68-75%, satisfactory - acceptable results,
E: 60-67%, sufficient - the results meet the minimum criteria,
Fx: 0-59%, insufficient - additional work required
Scale of assessment (preliminary/final): 80 / 20

Learning outcomes:
Knowledge of the school system in the Slovak Republic in comparison with successful education systems in other countries, understanding of the management system and organization of education in the Slovak Republic at all levels, orientation in school and labor legislation, pedagogical documents, electronic systems used in primary and secondary schools (eg Edupage). Ability to apply knowledge of other disciplines in the field of school management.

Class syllabus:
Basic terminology of school management. Education system in the Slovak Republic and education management system. School management models. Personality of a leading pedagogical employee

- legal and personal requirements, leadership styles. Hierarchy of education workers. Control activities in schools, apprenticeship. School and labor legislation (legal regulations governing the activities of primary and secondary schools - laws, decrees, work regulations, pedagogical-organizational instructions, pedagogical documentation), time management. Edupage. Teacher professional development. Class teacher.

Recommended literature:

HALÁKOVÁ, Z., NAGYOVÁ, S., NAGY, T. 2019. School management for students of science subjects with practical examples. Bratislava: UK.
OBDRŽÁLEK, Z. 2002. School and its management. Bratislava: UK.
OBDRŽÁLEK, Z., HORVÁTHOVÁ, K. et al. 2004. Organization and management of education. Terminological and interpretative dictionary. Bratislava: SPN.
EGER, L. 2006. School management. Pilsen: Fraus.
PISOŇOVÁ, M. 2012. Personality development of the school principal - starting points and determinants.
Current legal regulations governing the activities of primary and secondary schools (laws, decrees, internal regulations, pedagogical-organizational instructions).
Pedagogical documentation
WONG, H. K., WONG, R.T. The first days of school: How to be an effective teacher. Mountain View, CA: Harry K. Wong Publications, 2005.
LAU, W. Teaching Computing in Secondary Schools: A Practical Handbook. Routledge, 2017.
LEMOV, D. Teach like a champion 2.0: 62 techniques that put students on the path to college. John Wiley & Sons, 2015.
CANGELOSI, J. S. Classroom Management Strategies: How to Gain and Maintain Pupils' Cooperation in Teaching. Portal, 1996.
Current Internet resources and journal sources (Education Technology, School Management in Practice, Quality and more).

Languages necessary to complete the course:
Communication - Slovak
Study of literature - Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 167

A	B	C	D	E	FX
53,29	16,77	20,36	4,79	0,6	4,19

Lecturers: doc. Mgr. Karolína Miková, PhD., PaedDr. Tünde Kozánek Kiss, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-232/22	School Physics (1)

Educational activities:
Type of activities: lecture / laboratory 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:
During the semester there will be two written examinations, each for max. 25 points. An oral exam will take place during the exam period (max. 50 points). The condition for registering for the oral exam is a success rate of more than 50% in the continuous evaluation. Final evaluation: A = (92, 100]%, B = (84, 92]%, C = (76, 84]%, D = (68, 76]%, E = (60, 68]%).
The condition for granting credits is the achievement of at least 60% marks.

Learning outcomes:
By completing the course, the student will gain an overview of the content of the topics mechanical waves and acoustics, electromagnetic waves and optics, atomic physics, nuclear physics and radioactivity in school physics. At a level appropriate to the future beginning physics teacher, he / she will know the key barriers of primary and secondary school students in learning about these areas of physics. The student will be able to think about teaching these topics in broader contexts.

Class syllabus:
Mechanical waves. Sound and ultrasound. Light and geometric optics. Wave properties of light. Electromagnetic radiation. Non - ionizing electromagnetic radiation. Ionizing electromagnetic radiation. Structure of matter, atoms and molecules. From classical to quantum physics. Atomic nucleus and radioactivity. Interaction of radioactive radiation with matter.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 31

A	B	C	D	E	FX
48,39	35,48	3,23	3,23	3,23	6,45

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

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-233/22	School Physics (2)

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

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KDMFI/1-UFY-220/15 - Introduction to School Experiments or FMFI.KDMFI/1-UFY-120/15 - Mathematical Methods in Physics (1)

Course requirements:
During the semester, there will be two written examinations of 20 points each, protocols prepared by students will also be evaluated, for a total of 30 points. The final exam will consist of a practical check for 30 points. A, it is necessary to obtain at least 92 points, at least 84 points to obtain a B rating, at least 76 points to obtain a C rating, at least 68 points to obtain a D rating and at least 60 points to obtain an E rating. Credits will not be granted to a student who does not pass the final practical exam for at least 20 marks.

Learning outcomes:
Graduates of the course will have a systematic and confirmed knowledge of selected chapters of high school physics from the perspective of a physics teacher and a student of a basic university course (aware of the interconnectedness of high school and university physics); they will be aware of the usual misconceptions and simplifications related to high school physics. They will be able to design and implement an experiment related to the topic at the level of a teacher's assistant.

Class syllabus:
Systematization of higher secondary school physics. Detailed study of topics: Electrostatics, comparison of Coulomb's and Newton's law, homogeneous and radial electric fields. Direct current, Ohm's law, Kirchhoff's laws. Stationary and non-stationary magnetic fields. Particle motion in electric and magnetic fields. Electromagnetic induction, Faraday's law. AC circuits.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
70,0	20,0	10,0	0,0	0,0	0,0

Lecturers: PaedDr. Peter Horváth, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-337/22	Selected Parts of Didactics of Physics for Secondary School Graduates

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: FMFI.KDMFI/1-UFY-220/15 - Introduction to School Experiments

Course requirements:
Continuous assessment: written tests (3x20 marks), homeworks (4x10 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% marks.

Learning outcomes:
The student knows the specifics of the didactics of preparing high school students for the graduation exam in physics.

Class syllabus:
Requirements for high school graduates in physics in the following areas: level of knowledge in physics, level of ability to apply their knowledge in solving complex problems, level of ability to apply their knowledge to formulate a research question that can be solved by physics experiment. Specifics of graduate training in the topics: mechanics, energy conservation, geometric and wave optics, atomic and nuclear physics. The use of exponential and logarithmic functions in the preparation of high school graduates in physics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 4

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

Lecturers: PaedDr. Tünde Kozánek Kiss, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 155

A	ABS	B	C	D	E	FX	NEABS
40,65	21,29	7,1	4,52	0,65	1,29	21,29	3,23

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 87

A	ABS	B	C	D	E	FX	NEABS
63,22	18,39	1,15	1,15	0,0	0,0	9,2	6,9

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-332/22	Social Aspects of Informatics

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: 3.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KDMFI/1-INF-175/00

Course requirements:
Continuous evaluation: two seminar works, presentation resp. third seminar work
In the case of three seminar papers, the evaluation of each thesis will be 1/3 points, in the case of 2 seminar papers and the presentation, the evaluation of the seminar paper will be 25% points and the presentation 50% points.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students lead science as information technology changes society (in historical context)

Class syllabus:
New ICT technologies are evolving very fast. But they are constantly entering our daily lives. We note what changes, what positive, but also what risks ICT brings in various areas: education, health, arts, business and finance, industry and others. We will pay special attention to the issue of copyright and its infringement and cybercrime.
Also what risks they bring.

Recommended literature:
Abelson, Ledeen, Lewis, BlownTo Bits, Addison Wesley 2008, www.bitsbook.com
information on the subject's website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 192

A	B	C	D	E	FX
94,27	1,56	0,52	1,04	1,56	1,04

Lecturers: RNDr. Michal Winczer, PhD.
Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 310

A	B	C	D	E	FX
99,03	0,32	0,32	0,0	0,0	0,32

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 298

A	B	C	D	E	FX
92,62	0,0	0,0	0,0	0,34	7,05

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 58

A	B	C	D	E	FX
98,28	0,0	0,0	0,0	0,0	1,72

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 41

A	B	C	D	E	FX
90,24	0,0	0,0	0,0	0,0	9,76

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UMA-311/23	Students' Research Exhibition

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

Number of credits: 2

Recommended semester: 6.

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: 0

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

Lecturers: doc. PaedDr. Mária Slavíčková, PhD.

Last change: 15.01.2024

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-UXX-152/22	Summer Sports Camp

Educational activities:
Type of activities: training session
Number of hours:
per week: **per level/semester:** 5d
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 2., 4.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KTV/1-MXX-217/18

Course requirements:
The final evaluation of the subject includes the completion of all compulsory disciplines and the assessment of the acquired abilities to perform individual disciplines independently, methodically correct, or with instruction. At least 91% of points must be obtained to obtain an A rating, at least 81% to obtain a B rating, at least 71% to obtain a C rating, at least 61% to obtain a D rating and at least 50% to obtain an E rating. Credits will not be awarded to a student who scores less than 50% of the points.

Learning outcomes:
Gain basic theoretical knowledge and practical skills from hiking, living and physical activities in nature. Masters the theoretical basis for the selection of a suitable natural area for the implementation of individual sports in nature. The student is able to characterize individual sports in nature and forms of their implementation. Masters the theoretical basis of didactics of training and improving movement techniques in selected outdoor sports. Masters the theoretical basis of selection, setting, use and maintenance of basic material equipment for selected sports in nature.

Class syllabus:
A comprehensive overview of theoretical and practical problems in tourism, stay and physical activities in nature and the prerequisites for their solution. Outdoor sports in connection with the development of modern society. Impact of outdoor sports on the environment, regional development, tourism and the economy. Historical aspects of outdoor sports and their position in human society. Basic division of outdoor sports. (Summer, winter, water, board, technical, motor, Olympic, ...) Institutional provision of outdoor sports in our country and in the world. The structure of sports performance of selected outdoor sports. The structure of sports performance in canoeing, road and mountain biking. Training and improving the technique of implementation of selected outdoor sports. Training and improvement of kayaking and canoeing, road and mountain biking. Training and improvement of shooting with air weapons.

Recommended literature:
1. Židek, J.: Turistika a ochrana života a zdravia. Bratislava. FTVŠ UK 2013, 123 s. ISBN

9788022333986
2. Michal, J.: Vybrané kapitoly zo sezónnych činností. PF UMB 1998 str.108 ISBN 80-85162-99-7
3. Neuman a kol. : Turistika a sporty v přírodě. Praha, Portál 2000.
4. Žídek, J.: Turistika. Bratislava, FTVŠ UK 2004.
5. Kompán, J.- Gorner, K. 2007. Možnosti uplatnenia turistiky a pohybových aktivít v prírode. FHV
UMB ISBN 80-8083-365-7
6. Stejskal, T.: Vodná turistika. Prešov 1999.
7. Sýkora, B. a kol.: Turistika a sporty v prírode. SPN Praha, 1986.
8. Zajac a kol.: Športy a turistika na vode. Šport, Bratislava,

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide sports and material equipment

Past grade distribution
Total number of evaluated students: 53

A	B	C	D	E	FX
96,23	0,0	0,0	0,0	0,0	3,77

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

Last change: 16.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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: 72

A	B	C	D	E	FX
52,78	19,44	6,94	4,17	4,17	12,5

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

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. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAG/1-UXX-851/22	Teaching Practice A (1)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 5d
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Course evaluation is conditional on:
• completing observations (lessons) in the scope of an hour-long training teacher,
• active participation of the student in extracurricular and extracurricular activities of a practicing teacher,
• evaluation of the student by the training teacher,
• evaluation of the pedagogical diary, which the student submits to the head of the pedagogical practice within the set deadline.
In total, a student can get 42 points for pedagogical practice.
The evaluation of the subject is graded in percentage as follows: A (100-91%); B (90-81%); C (80-71%); D (70-61%); E (60-50%). At least 38 points must be obtained to obtain an A rating, at least 34 points to obtain a B rating, at least 30 points to obtain a C rating, at least 26 points to obtain a D rating and at least 21 points to obtain an E rating. Credits will not be awarded to a student who obtains less than 21 points out of the total number of points.
For non-compliance with the set deadlines and instructions of the head of the pedagogical practice, the student may be sanctioned by lowering the evaluation, or by not granting credits for the pedagogical practice.

Learning outcomes:
By completing the course, the student:
• deepen knowledge in the field of generally binding legal regulations related to the work of teachers, pedagogical and other documentation, conceptual and strategic documents of the school,
• develop the professional competencies necessary for independent planning, design, management and organization of the educational process in the relevant subject on the basis of valid curricular documents, while adapting educational programs for specific groups of students,
• develop professional competencies associated with didactic, pedagogical, psychological analysis of individual parts of the lesson,
• develop the ability to apply pedagogical-psychological and professional-didactic knowledge in the educational process,

• develop the ability to evaluate diverse pedagogical situations and processes,
• deepen knowledge about the differences in the development of individuals resulting from their health, social disadvantages, talents or talents so that they can effectively cooperate with special pedagogues, psychologists and other professionals in the implementation of the educational process in the conditions of inclusive education and follow their professional recommendations and conclusions
• develop skills in working with teaching aids,
• acquire competencies associated with the creation of a pedagogical portfolio,
• develop competencies of self-assessment and further professional development,
• develop the ability to assess the suitability of the chosen means of education,
• develop communication skills, the ability to express and accept constructive criticism and praise.

Class syllabus:
Getting acquainted with the conditions of implementation of pedagogical practice.
Familiarization with pedagogical documentation, conceptual and strategic documents of the training school.
Participation in teaching within the scope of the training teacher, extra-class and extracurricular activities.
Creation of observation records from the teaching teacher 's lessons.
Creation of lesson analyzes.
Creation of written preparations for lessons.
Creation of a pedagogical diary and its submission to the head of pedagogical practice.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 59

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

Lecturers: RNDr. Michal Winczer, PhD., Mgr. Michaela Vargová, PhD., PaedDr. Peter Horváth, PhD., RNDr. Jana Chalmovianská, PhD., PaedDr. Mgr. Natália Kováčová, PhD.

Last change: 01.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAG/1-UXX-852/22	Teaching Practice B (1)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 5d
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Course evaluation is conditional on:
• completing observations (lessons) in the scope of an hour-long training teacher,
• active participation of the student in extracurricular and extracurricular activities of a practicing teacher,
• evaluation of the student by the training teacher,
• evaluation of the pedagogical diary, which the student submits to the head of the pedagogical practice within the set deadline.
In total, a student can get 42 points for pedagogical practice.
The evaluation of the subject is graded in percentage as follows: A (100-91%); B (90-81%); C (80-71%); D (70-61%); E (60-50%). At least 38 points must be obtained to obtain an A rating, at least 34 points to obtain a B rating, at least 30 points to obtain a C rating, at least 26 points to obtain a D rating and at least 21 points to obtain an E rating. Credits will not be awarded to a student who obtains less than 21 points out of the total number of points.
For non-compliance with the set deadlines and instructions of the head of the pedagogical practice, the student may be sanctioned by lowering the evaluation, or by not granting credits for the pedagogical practice.

Learning outcomes:
By completing the course, the student:
• deepen knowledge in the field of generally binding legal regulations related to the work of teachers, pedagogical and other documentation, conceptual and strategic documents of the school,
• develop the professional competencies necessary for independent planning, design, management and organization of the educational process in the relevant subject on the basis of valid curricular documents, while adapting educational programs for specific groups of students,
• develop professional competencies associated with didactic, pedagogical, psychological analysis of individual parts of the lesson,
• develop the ability to apply pedagogical-psychological and professional-didactic knowledge in the educational process,

• develop the ability to evaluate diverse pedagogical situations and processes,
• deepen knowledge about the differences in the development of individuals resulting from their health, social disadvantages, talents or talents so that they can effectively cooperate with special pedagogues, psychologists and other professionals in the implementation of the educational process in the conditions of inclusive education and follow their professional recommendations and conclusions
• develop skills in working with teaching aids,
• acquire competencies associated with the creation of a pedagogical portfolio,
• develop competencies of self-assessment and further professional development,
• develop the ability to assess the suitability of the chosen means of education,
• develop communication skills, the ability to express and accept constructive criticism and praise.

Class syllabus:

Getting acquainted with the conditions of implementation of pedagogical practice.
Familiarization with pedagogical documentation, conceptual and strategic documents of the training school.
Participation in teaching within the scope of the training teacher, extra-class and extracurricular activities.
Creation of observation records from the teaching teacher 's lessons.
Creation of lesson analyzes.
Creation of written preparations for lessons.
Creation of a pedagogical diary and its submission to the head of pedagogical practice.

Recommended literature:

All valid textbooks for primary and secondary schools
Innovated SEP for the 2nd grade of elementary school
An innovated SEP for grammar schools with a four-year and five-year educational program
Target requirements for knowledge and skills of high school graduates in biology
ŠkVP training school
Internal rules of the school
Gnoth, M., Ušáková, Fulková, E., Likavský, P., Turanová, L., Čipková, E., Tóthová, A., Grančičová, A. 2003. Pedagogical practice for students of teacher combinations at the Faculty of Science, Comenius University. Bratislava: Comenius University Bratislava, 2003. 140 p.
Kosová, B., Tomengová, A. 2015. Professional practical training of future teachers. Banská Bystrica: Belianum, 2015. 225 p.
DOUŠKOVÁ, K., ĽUPTÁKOVÁ-VANČÍKOVÁ, K. 2009. Pedagogical practice in teacher training. Banská Bystrica: Matej Bel University, 2009. FULKOVÁ, E., GNOTH, M. 2004. Pedagogical practice. Nitra: Slovak University of Agriculture, 2004. GAVORA, P. 1997. ABC observations of teaching. Prešov: Metodicko-pedagogické centrum, 1997. KONTÍROVÁ, S. 2011. Pedagogical practice of students of academic subjects. Košice: Pavel Jozef Šafárik University, 2011.
FULKOVÁ, E., GNOTH, M. 2004. Pedagogical practice. Nitra: Slovak University of Agriculture, 2004.
State curriculum for ISCED 2 and ISCED 3
KONTÍROVÁ, S. 2011. Pedagogical practice of students of academic subjects. Košice: Pavel Jozef Šafárik University, 2011.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 70

A	ABS	B	C	D	E	FX
91,43	0,0	8,57	0,0	0,0	0,0	0,0

Lecturers: RNDr. Michal Winczer, PhD., Mgr. Michaela Vargová, PhD., PaedDr. Peter Horváth, PhD., M. A. Linda Steyne, PhD., RNDr. Jana Chalmovianská, PhD., PaedDr. Mgr. Natália Kováčová, PhD., doc. PaedDr. Janka Peráčková, PhD.

Last change: 01.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-132/22	Theoretical Fundaments of Education

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

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI-Prif.KDPP/1-UXX-132/10

Course requirements:
The course is completed by evaluation, the ratio of continuous / final evaluation is 100/0.
Continuous assessment: active participation in seminars and cooperation with other students (30), homework assignments (30), elaboration of the assigned topic and its presentation at the seminar (20), seminar paper (20)
The condition for successful completion of the course is to obtain half of the points for participation in seminars and homework and submit a presentation and seminar paper. At least 60% of the maximum possible evaluation of the subject must be obtained. The rating is given on a scale:
A (100-91%, excellent - excellent results),
B (90-81%, very good - above average standard),
C (80-73%, good - normal reliable work),
D (72-66%, satisfactory - acceptable results),
E (65-60%, sufficient - results meet minimum criteria),
Fx (59-0%, insufficient - additional work required)
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Upon successful completion of the course, the students have basic knowledge of selected pedagogy disciplines about the nature of education, the philosophical basis of pedagogical thinking and theoretical concepts of education in a historical context. They understand basic pedagogy term, has knowledge of the domains of education. They know the basic development trends of pedagogy, as well as the basic developmental stages of the school. Students understand the school as an institution of formal education and knows the forms of non-formal education. They have basic knowledge about selected current problems of pedagogical practice, about the family and its functions, about the pupil and about learning problems and about educational problems at school.

Class syllabus:
Educational sciences: traditional and modern concepts. Understanding of education and its explanation. Socialization and education. Philosophical basis of pedagogical thinking. Theoretical

concepts of education. Social context of upbringing and education. Education in the changes of time (basic development trends of pedagogy - J. A. Komenský, J. J. Rousseau, J. H. Pestalozzi, J. F. Herbart and pedagogical currents of the 20th century). Subject and object of education, educational interaction. Teacher personality and profession. Institutionalization of education. School, its development and functions. Alternative schools. The student and his social role, family and its educational function, cooperation with the school. Selected current problems of educational practice. Educational problems, education of students with special educational needs. Educational impacts of the school (school climate, hidden curriculum). From education to self-education, free education.

Recommended literature:

BAĎURÍKOVÁ, Z. et al. 2001. School pedagogy. Bratislava: Comenius University.
BREAUX, A .: Quick help for teachers. Portal. 2020.
DYTRTOVÁ, R. - KRHUTOVÁ, M. 2009. Teacher: příprava na profesi. Prague: City.
FONTANA, D. 2014. Psychology in school practice. Prague: Portal.
GINNIS, P .: Effective Teaching Tools for Teachers. Universum Publishing House, 2019.
GORDON, T .: School without Losers. Malvern. 2015.
HAVLÍK, R. - KOŤA, J. 2001. Sociology of education and school. Prague: Portal.
HELUS, Z. 2007. Social psychology for pedagogues. Prague: City.
HLASNA, Slavka et al. 2006. Introduction to pedagogy. Nitra: Enigma.
JEDLIČKA, R., KOŤA, J., SLAVÍK, J., 2018. Educational psychology for teachers. Prague: Grada Publishing, a. s., 2018.
KRATOCHVÍLOVÁ, Emília et al. 2007. Introduction to pedagogy. Trnava: Faculty of Education, Trnava University in Trnava.
KYRIACOU, CH. 2005. Solving educational problems at school. Prague: Portal.
KYRIACOU, CH. 2008. Key teacher skills. Prague: Portal.
MOŽNÝ, I. 2008. Family and society. Prague: SocioLOgické Nakladatelství (SLON).
ONDREJKOVIC, P. et al. 2009. Social pathology. Bratislava: Science.
PRŮCHA, J. 2017. Modern pedagogy. Prague: Portal.
POTOČÁROVÁ, M. 2008. Pedagogy of the family. Bratislava: UK.
SMETÁČKOVÁ, I., ŠTECH, S .: Učitelské vyhoření. Portal. 2020.
VACEK, P. 2008. Development of moral consciousness of students. Prague: Portal.
VALIŠOVÁ, A - KASÍKOVÁ. H. 2007. Pedagogy for teachers. Prague: City.
ZELINA, M. 2004. Theories of education or search for good. Bratislava: SPN.

Languages necessary to complete the course:
Slovak and Czech language

Notes:

Past grade distribution
Total number of evaluated students: 137

A	B	C	D	E	FX
64,96	15,33	10,95	5,84	0,0	2,92

Lecturers: Mgr. Lucia Budinská, PhD., doc. Mgr. Karolína Miková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UXX-134/22	Theory of Teaching

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

Number of credits: 3

Recommended semester: 3.

Educational level: I., II., N

Prerequisites:

Antirequisites: FMFI.KDMFI/1-UXX-134/18

Course requirements:
The course is completed by a written exam (20%).
A minimum of 60% of the semester is required to be admitted to the exam.
During the semester, students implement at least one didactic output (20%), actively participate in exercises (20%), solve assignments during lectures (10%), prepare a term paper (10%), read and report the content of recommended literature (10%), 2 tests during the semester (10%)
The rating is given on a scale:
A: 93-100%, excellent - excellent results,
B: 85-92%, very good - above average standard,
C: 76-84%, good - normal reliable work,
D: 68-75%, satisfactory - acceptable results,
E: 60-67%, sufficient - the results meet the minimum criteria,
Fx: 0-59%, insufficient - additional work required
Scale of assessment (preliminary/final): 80 /0 20

Learning outcomes:
Acquisition of basic theoretical knowledge in didactics, development of knowledge, skills and attitudes associated with the teaching profession, the ability to plan and organize students' learning activities. Students will gain an overview of basic didactic terminology, knowledge prerequisites to view the teaching process as a system whose individual elements (teaching objectives, curriculum content, teaching methods, teaching aids and techniques, organizational forms of teaching, teaching concepts; communication between teacher and students, as well as monitoring and evaluation of the teaching process and teacher preparation for teaching) are closely linked and to be able to use the acquired knowledge in specific planning of the teaching process (creating a "scenario" of the lesson).
They will gain basic habits of working with the class as a group.

Class syllabus:

Didactics as a scientific discipline (subject of research, methods of didactic research, terminology), its position in the system of pedagogical disciplines
Didactics system
Teaching process
Content of education, curriculum, didactic analysis of curriculum
Taxonomy of educational goals
Teaching planning
Teaching principles
Teaching methods, teaching strategies
Testing and evaluation
Learning tasks and didactic tests
Current teaching concepts (project, problematic, programmed, differentiated, group, cooperative, problematic, project, research-oriented, authentic, constructivist, online, electronic, hybrid, modular, integrated thematic (ITV), STEM / STEAM, mastery learning, closed cycle (SVUC), Hejného method
Organizational forms of teaching
Teaching aids and teaching equipment

Recommended literature:

ČAPEK, R. 2015. Modern didactics: Lexicon of teaching and assessment methods. Prague: City.
FERENCOVÁ, J., KOSTURKOVÁ, M. 2020. Chapters from didactics. From learning to teaching. Prešov: Rokus publishing.
KALHOUS, Z., OBST, O. 2001. School didactics. Prague: Portal.
SKALKOVÁ, J. 2007. General didactics. 2nd ed. Prague: City.
KOŽUCHOVÁ, M. et al. 2000. General didactics. Bratislava: Science.
OBDRŽÁLEK, Z. et al. 2003. Didactics for elementary school students. Bratislava: UK.
PASCH, M. et al. 1998. From educational program to lesson. Prague: Portal.
PETLÁK, E. 2016. General didactics. Bratislava: Iris.
PETTY, G. 1996. Modern teaching. Prague: Portal.
PRŮCHA, J. 2002. Modern pedagogy. 3rd ed. Prague: Portal.
TUREK, I. 2014. Didactics. Bratislava: Iura Edition.
TÓTHOVÁ, R., KOSTRUB, D., FERKOVÁ, Š. 2017. Pupil, teacher, teaching. Bratislava: Rokus.

Languages necessary to complete the course:
Slovak, Czech

Notes:

Past grade distribution
Total number of evaluated students: 195

A	B	C	D	E	FX
41,54	27,18	15,38	7,18	1,54	7,18

Lecturers: doc. Mgr. Karolína Miková, PhD., Mgr. Lucia Budinská, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/1-UFY-265/15	Unconventional Physics

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:

Course requirements:
Continuous assessment: active seminar work (40 marks), assessment of teaching-learning sequences (3x20 marks)
Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Credits will not be awarded if a student scores less than 50%.

Learning outcomes:
The student will be able to apply physics in non-traditional, practical tasks and interesting life situations. He will get inspiration to lead a physics afternoon class at school.

Class syllabus:
Students will get acquainted with non-traditional approaches to the introduction and practice of selected physical concepts and laws from the curriculum of primary and secondary school through simple experiments, non-traditional tasks, home laboratory tasks, projects. They will get acquainted with the possibilities of using these approaches in non-formal and informal science education.

Recommended literature:

Languages necessary to complete the course:
Slovenský a anglický.

Notes:

Past grade distribution
Total number of evaluated students: 61

A	B	C	D	E	FX
96,72	1,64	0,0	0,0	0,0	1,64

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-UFY-210/22	Waves and Optics

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

Number of credits: 5

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Continuous assessment: written tests (2x10 marks), lab reports (2x15 marks)
Exam: written (30 marks), oral (20 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50% marks.

Learning outcomes:
Graduates have a systematic knowledge of mechanical waves (including sound) and wave optics at the level of a core university physics course. They have an idea of the boundaries between graduation and university physics in the field of wave optics from the point of view of work with high school youth with an increased interest in physics.

Class syllabus:
Oscillations and oscillating systems (modes, resonators, oscillations and waves, Fourier analysis of oscillations). Waves (harmonic waves, complex notation, wave superposition, wave polarization, Doppler effect, wave diffraction, waves in physics, and waves at boundaries). Wave optics (light interference, light diffraction, holography, light dispersion in dielectrics, dispersion, polarization by reflection and refraction, spreading of light in anisotropic conditions). Geometrical optics and basics of optical projection. Photo metrics. Contemporary problems in optics.

Recommended literature:

Languages necessary to complete the course:
Slovak ad English.

Notes:

Past grade distribution
Total number of evaluated students: 156

A	B	C	D	E	FX
26,92	21,79	26,92	15,38	8,33	0,64

Lecturers: prof. RNDr. Pavel Veis, CSc.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-UXX-151/22	Winter Sports Camp

Educational activities:
Type of activities: training session
Number of hours:
per week: **per level/semester:** 5d
Form of the course: on-site learning

Number of credits: 1

Recommended semester: 1., 3., 5.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KTV/1-MXX-216/18

Course requirements:
The final evaluation of the subject includes the completion of all compulsory disciplines and the assessment of the acquired abilities to perform individual disciplines independently, methodically correct, or with instruction. At least 91% of points must be obtained to obtain an A rating, at least 81% to obtain a B rating, at least 71% to obtain a C rating, at least 61% to obtain a D rating and at least 50% to obtain an E rating. Credits will not be awarded to a student who scores less than 50% of the points.

Learning outcomes:
The student knows the history of skiing in the world and in Slovakia. He masters the nomenclature, classification scales of licenses, material equipment, knowledge of the terrain and movement in winter in various weather conditions. He knows the fitness, technical training in downhill skiing. Masters the practical skills of using and maintaining the equipment. Controls the specific way of movement in mountain and ski terrain, ways of calling for help. He knows the ways of teaching instruction and the work of an instructor in a ski school.

Class syllabus:
History, terminology, classification
Material and technical equipment
Principles of safety in the mountains
Basic skiing skills - improving technique
Visit to the ski service in the resort

Recommended literature:
1. BLAHUTOVÁ, A. (2002). Technika a metodika zjazdového lyžovania.
2. BLAHUTOVÁ, A.(2017). Technika a didaktika lyžovanie, Učebné texty, KU, Ružomberok 2017
3. EGYHÁZY, A. (1988). Lyžovanie – Základný lyžiarsky výcvik. Učebné texty pre školenie cvičiteľov. Šport, Bratislava 1988.

4. HELLEBRANDT, V. (2002). Technika a metodika carvingových oblúkov v zjazdovom lyžovaní. Vysokoškolské učebné texty. FTVŠ Bratislava 2002.
5. PŘÍBRAMSKÝ, M. (2002). Česká škola lyžování. Carving. Praha: UK FTVS, 2002.
6. SOSNA, I. Carving ad 1972. (2006). Snow 2006, č.25, s.32 -33.
7. SOUKUP, J. (1991): Lyžování podle alpských lyžařských škol. Praha, Olympia, 1991.
8. ŠTUMBAUER, J. - VOBR, R. (2007). Carving. České Budejovice: KOPP, 2007, 125 s.
9. ŽÍDEK, J. et al. (1993). Lyžovanie. Vysokoškolské skriptá. Bratislava, UK 1993

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 46

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

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

Last change: 16.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Ivan Kalaš, PhD.