Course descriptions

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COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-165/22	Advanced Practicum of Physics School Experiments

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: II.

Prerequisites:

Course requirements:
Continuous assessment: individual work - preparation and demonstration of the experiment (3x20 marks), lab reports (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:
Students will be familiar with a number of experiments with simple equipment. They will know the requirements for a simple physics experiment. Preparation of experiments using modern technology and using DT. They will gain experience in presenting simple experiments, consolidating and deepening knowledge of physics and examples of ways to help students develop their physical knowledge. They will know the sources of information about low-cost experiments.

Class syllabus:
Experiments especially on the topics of pressure, compressive force, fluid mechanics, rigid body mechanics, properties of substances of different states, transformations of states, demonstration experiments in electromagnetism with non-traditional equipment.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 67

A	B	C	D	E	FX
100,0	0,0	0,0	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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-357/22	Algorithms and Data Structures (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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: assessment of short tests (50%) and several smaller projects (50%)
Indicative grading scale: A 88%, B 81%, C 74%, D 67%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completion of the course, students will be familiar with more advanced data structures and algorithms, understand how they can be used in problem solving, be able to estimate the complexity of operations on individual structures, and compare programs solving the same complex problem in terms of efficiency.

Class syllabus:
- Advanced balanced trees (B-tree, Red-Black tree, Splay tree)
- Lexicographic tree, Skip list
- Heap
- Advanced Hashing
- Other sorting algorithms
- Heuristic algorithms, probabilistic algorithms

Recommended literature:
• the teacher's own electronic study materials published on the course website or in the Moodle system
• Lee, K.D., Hubbard, S.: Data Structures and Algorithms with Python, Springer, 2015
• Ryant, I.: Algoritmy a datové struktury objektově, 2017, S. 288
• Wróblewski, P.: Algoritmy: Datové struktury a programovací techniky, Computer Press, 2004, S. 350
• Mehlhorn , K., Sanders, P.: Algorithms and data structures: The basic toolbox. Berlin: Springer, 2008
• Cormen, T.H., Leiserson, C.E., Rivest, R.L., Syein, C. : Introduction to Algorithms, MIT Press; 3rd edition, 2009

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: prof. RNDr. Zuzana Kubincová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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-133/23	Artificial Intelligence for Everyone

Educational activities:
Type of activities: training session / course
Number of hours:
per week: 9 **per level/semester:** 1t / 117
Form of the course: on-site learning

Number of credits: 6

Recommended semester:

Educational level: 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: 22

A	B	C	D	E	FX
45,45	36,36	4,55	9,09	4,55	0,0

Lecturers: prof. Ing. Igor Farkaš, Dr.

Last change:

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-256/15	Assessment of the Science Education Results

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: 4.

Educational level: II., N

Prerequisites:

Course requirements:
Continuous assessment: discussions (3x20 marks), presentation of the results of individual work (40 marks)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will not be awarded if student scores less than 50%.

Learning outcomes:
The graduate will know the basic principles for creating goals of physics and science education for formal education and also the relationship between formal and non-formal education. They will know the basic ways of evaluating the results of physics and science education.

Class syllabus:
Objectives of education, Taxonomy of objectives. Educational methods and methods of measuring educational results at the class and school level. Nationwide testing. High stakes testing. International measurements in science education.

Recommended literature:

Languages necessary to complete the course:
Slovenský a anglický.

Notes:

Past grade distribution
Total number of evaluated students: 31

A	B	C	D	E	FX
87,1	6,45	3,23	0,0	0,0	3,23

Lecturers: PaedDr. Lukáš Bartošovič, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/2-UFY-220/00	Astronomy and Meteorology

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: tests (2x30 marks), discussions (4x10 marks).
Indicative assessment: A: 100-90%, B: 90-80%, C: 80-70%, D: 70-60%, E: 60-50%.
Credits will not be awarded if a student scores less than 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will know the basic concepts in astronomy, the origin and development of individual cosmic bodies and structures, an explanation of the physical nature of atmospheric processes and processes taking place in the air, which create weather and climate, acquaintance with methods of forecasting synoptic situations and weather conditions.

Class syllabus:
History of astronomy, spherical astronomy (coordinate systems, stellar aberration, parallax, refraction), Solar system (Sun, planets, dwarf planets, comets, asteroids, meteors), origin and evolution of stars (Jeans critical mass, H-R diagram, nucleogenesis of elements, final evolution stages of stars), galactic astronomy, cosmology. Subject of meteorology, basic conceptions, role and organization of meteorological service. Basic meteorological elements and instrumentation of meteorological station. State equation, principal statics equation, barometric formula. Condensation and sublimation of water vapour. Adiabatic and pseudoadiabatic phenomenons. Thermal stratification. General circulation. Air masses. Atmospheric fronts. Pressure systems. Weather predictions. Human influence on climate.

Recommended literature:
Vanýsek V. 1980, Základy astronómie a astrofyziky, Academia Praha
Beatty J. K., Petersen C. C., Chaikin A. eds.: 1999, The New Solar System, Sky Publ. Corp. and Cambridge Univ. Press
Netopil, R. a kol.: Fysická geografie 1. SPN, Praha, 1984, 272 s.
Zverev, A. S.: Synoptická meteorológia. Alfa, Bratislava, 1986, 711 s.
Munzar, J. a kol.: Malý průvodce meteorologií. Praha, 1989, 248 s.
Bednář, J.: Meteorologie. Portál, s.r.o., Praha, 2003, 224 s., ISBN 80-7178-653-5

Glossary of meteorology. Second edition. American Meteorological Society, Boston, 2000, 855 s., ISBN 1-878220-34-9

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 96

A	B	C	D	E	FX
86,46	9,38	4,17	0,0	0,0	0,0

Lecturers: RNDr. Marián Melo, PhD., prof. RNDr. Juraj Tóth, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-105/22	Computer Modeling and Measurement from the Perspective of Educational Psychology

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: II.

Prerequisites:

Course requirements:
Continuous assessment: 2 micro-appearances in front of the audience, evaluation of micro-appearances of classmates
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will develop the ability to use the resources of a computer-assisted science laboratory in teaching their approbation subjects in primary and secondary school. They will be able to plan the student's activity and the teacher's activity in the student's experiment, they will be able to use the CMA Coach science laboratory system and they will be able to evaluate the students' work in this laboratory.

Class syllabus:
student-supported guided research in science subjects, research teaching methods, interface, sensors, measurement with sensors, computer control (programming in Coach language), basics of laboratory safety, measurement of physical quantities and processing of measured values, measurement with sensors in chemistry teaching and biology, the use of the CMA Coach system in students' hobby work (within non-formal education), basic rules for the creation of instructional materials for students

Recommended literature:
Computer Aided Science Laboratory / Peter Demkanin et al .. Bratislava: Knižničné a edičné centrum, 2006
Evidence based teaching: A practical approach / Geoff Petty. Cheltenham: Nelson Thornes, 2006
Modern teaching: practical guide / Geoffrey Petty; translated from English by Štěpán Kovařík. Prague: Portal, 1996
Own electronic texts of the subject published through the subject's website.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 19

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: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-113/22	Computer Networks in the School Environment

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

Number of credits: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: solving tasks
Indicative assessment scale: A 88%, B 75%, C 65%, D 58%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students will have a basic overview of computer networks - the basics of network technology, communication principles, methods of interconnection and security in computer networks.

Class syllabus:
• basic concepts, history, origin and development of computer networks
• OSI reference model
• basics of topology and communication
• network technologies and protocols
• network hardware
• addressing, routing,…
• basics of computer network security
• specifics of network use in the school environment

Recommended literature:
• The teacher's own electronic study materials published on the subject's website or in the Moodle system

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 28

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

Lecturers: doc. RNDr. Ľubomír Salanci, PhD., Mgr. Miroslav Wagner

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-112/22	Computer and Operating Systems

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

Number of credits: 3

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: solving tasks (60%)
Exam: written (40%)
Indicative assessment scale: A 88%, B 75%, C 65%, D 58%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course, the student will be able to understand the activities of a simple compiler or interpreter and modify it. They will have an overview of the internal structure of operating systems, with their tasks, the problems they solve and with the theoretical foundations and algorithms they use to solve them. In the language of symbolic addresses it can solve simple algorithmic problems (at the level of working with memory, mathematical operations, comparisons and jumps). Using logic circuits, it can implement simple logic functions. They will understand the principle of computer operation at various levels - programming language, assembler, machine code, hardware layer.

Class syllabus:
• Computer data representation
• Compilation and interpretation
• Symbolic address language
• Implementation of logic functions at the hardware level
• Implementation of memory functions at the hardware level
• Processor, memory, input and output
• Operating system (OS) tasks
• Process management - process and thread, process state diagram, time dependence and its solutions, process and thread communication
• Memory management - simple memory management, virtual memory, segmentation, paging
• Device management - input / output software layers and their tasks
• File management - typical operations over files and directories and their implementation, structure of disks and files on PCs

Recommended literature:

• The teacher's own electronic study materials published on the subject's website

• Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika : Počítačové systémy 1-3: 1.2 Vzdelávanie nekvalifikovaných učiteľov informatiky na 2. stupni ZŠ a na SŠ / Peter Gurský a kol., Bratislava : Štátny pedagogický ústav, 2010

• Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika : Operačné systémy a počítačové siete : 1.3 Ďalšie vzdelávanie kvalifikovaných učiteľov informatiky na 2. stupni ZŠ a na SŠ / Peter Tomcsányi a kol., Bratislava : Štátny pedagogický ústav, 2010

Languages necessary to complete the course:

Slovak

Notes:

Past grade distribution

Total number of evaluated students: 108

A	B	C	D	E	FX
83,33	2,78	4,63	0,93	6,48	1,85

Lecturers: doc. RNDr. Ľubomír Salanci, PhD., Mgr. Miroslav Wagner

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-124/22	Consultations on Methodology for the Final Work

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: II.

Prerequisites:

Recommended prerequisites:
Methodology of pedagogical research

Course requirements:
individual work during the semester, focused on the research part of the diploma thesis - depending on the type of research and after a personal agreement with the teacher (60%) - min. 3 individual consultations
Exam: comprehensive research chapter of the future diploma thesis (40%)
Assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60 / 40

Learning outcomes:
The student:
- deepen their knowledge of the basic stages and methods of empirical research of educational phenomena related to their research topic of the diploma thesis
- design, implement and evaluate at least part of the research problem of their thesis
- write a comprehensive chapter in his diploma thesis on research activities

Class syllabus:
Course contents:
- Repetition of the basics of qualitative and quantitative research, processing and interpretation of empirical data.
- Implementation of procedures and selection of appropriate research techniques.
- Acquiring field data collection skills and solving related problems.
- Evaluation and consultation of the analysis of research results.
- Submission and presentation of the final work.

Recommended literature:
own electronic texts published on the website, resp. in the Moodle environment
Qualitative research in pedagogical sciences / Švaříček, Roman and Klára Šeďová. Prague: Portal, 2007

Methods of pedagogical research: basics of quantitative research / Chráska, Miroslav. Prague: City, 2007
Guide to Qualitative Research Methodology / Peter Gavora. Bratislava: Comenius University, 2007
Basics of pedagogical-psychological research for student teachers / Martin Skutil et al .. Prague: Portal, 2011
Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research / John W. Creswell. Pearson 2011

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
64,81	14,81	3,7	3,7	1,85	11,11

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-124/22	Consultations on Methodology for the Final Work

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: II.

Prerequisites:

Recommended prerequisites:
Methodology of pedagogical research

Course requirements:
individual work during the semester, focused on the research part of the diploma thesis - depending on the type of research and after a personal agreement with the teacher (60%) - min. 3 individual consultations
Exam: comprehensive research chapter of the future diploma thesis (40%)
Assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60 / 40

Learning outcomes:
The student:
- deepen their knowledge of the basic stages and methods of empirical research of educational phenomena related to their research topic of the diploma thesis
- design, implement and evaluate at least part of the research problem of their thesis
- write a comprehensive chapter in his diploma thesis on research activities

Class syllabus:
Course contents:
- Repetition of the basics of qualitative and quantitative research, processing and interpretation of empirical data.
- Implementation of procedures and selection of appropriate research techniques.
- Acquiring field data collection skills and solving related problems.
- Evaluation and consultation of the analysis of research results.
- Submission and presentation of the final work.

Recommended literature:
own electronic texts published on the website, resp. in the Moodle environment
Qualitative research in pedagogical sciences / Švaříček, Roman and Klára Šeďová. Prague: Portal, 2007

Methods of pedagogical research: basics of quantitative research / Chráska, Miroslav. Prague: City, 2007
Guide to Qualitative Research Methodology / Peter Gavora. Bratislava: Comenius University, 2007
Basics of pedagogical-psychological research for student teachers / Martin Skutil et al .. Prague: Portal, 2011
Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research / John W. Creswell. Pearson 2011

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
64,81	14,81	3,7	3,7	1,85	11,11

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-151/22	Creation, Analysis and Use of Algorithmic Tasks

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: II.

Prerequisites:

Course requirements:
Continuous assessment: active work in seminars (20%), homework (40%), projects (40%)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students are able to use basic algorithms to solve presented tasks, e.g. shortest path problem, pattern matching.
Students can create complex tasks using theoretical knowledge in conjuction with programming.
Students gain experience in creation of tasks which can be used in developing or rehersing or testing their competences.
Students can use algorithmic tasks from common Slovak programming competitions and their solutions as methodical materials.
Students can analyse solutions of pupils/students and give them constructive feedback.

Class syllabus:
Stručná osnova predmetu:
• recursion
• finding paths in graphs
• pattern matching
• computational geometry
• library algorithms of programming languages
• lesson plan creation based on programming competition task
• connecting computer science themes with algoritmic thinking and programming
• creation of tasks connected with real world (e. g. public transport lines)
• creation of tasks used in final exams
• solving of tasks from Olympiad in informatics

Recommended literature:
• Task archive on prask.ksp.sk
• The teacher's own electronic study materials published on the subject's website, resp. in Moodle

• Michal Forišek a Monika Steinová, Explaining Algorithms Using Metaphors, Springer, 2013
• Zbierka riešených úloh Korešpodenčného seminára z programovania (1998-2006), kolektív organizátorov KSP, FMFI UK, 2011

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 3

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

Lecturers: prof. RNDr. Zuzana Kubincová, PhD., Mgr. Michal Anderle, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-132/22	Cross-curricular Projects Focused on the Problems of Today's World

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: II.

Prerequisites:

Course requirements:
Continuous assessment: Active participation in classes (50%), design and implementation of a project with the implementation of a cross-cutting theme (50%).
An exam: -
Indicative evaluation scale: e.g. A 90%, B 80%, C 70%, D 60%, E 50%
Weight of the mid-term / final evaluation: e.g. 100/0
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student:
- is able to include cross-cutting themes in the teaching of their subject in an appropriate way (especially environmental, multicultural, regional and media education),
- learn about the possibilities of connecting approbation subjects in the form of project teaching,
- gets ideas and inspirations for interdisciplinary projects.

Class syllabus:
- Cross-cutting themes according to the official curriculum and the possibilities of their implementation in various subjects.
- Topics found in the intersection of various subjects.
- Authentic learning aimed at solving real problems of life.
- Design and implementation of a project with the implementation of a cross-cutting theme.
- Presentation of the results of the implemented project.

Recommended literature:
- own electronic texts published on the website, resp. in the Moodle environment
- Cárová, T. and Kohanová, I. 2012. Global primary school education - mathematics - methodical manual. [online] Slovak AID, Human at Risk, 2012. ISBN: 978-80- 970900-4-3 Available on the Internet: https://globalnevzdelavanie.sk/globalne-vzdelavanie-na-zs-matematika/
- Kireš. M., Ješková, Z., Ganajová, M., Kimáková, K. Research activities in science education. Bratislava: ŠPÚ, 2016.

- outputs from the IT academy project, where digital technologies are implemented in various subjects.

Languages necessary to complete the course:
Slovak

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., doc. PaedDr. Peter Vankúš, PhD., doc. PaedDr. Klára Velmovská, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-205/22	Current Trends in Physics Education

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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: project topic selection (10 marks), final project submission (20 marks), presentation (10 marks), peer-assessment of other projects (20 marks);
Examination: written (20 marks), oral (20 marks)
Indicative evaluation 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 be didactically prepared for the tasks assigned to the beginning teacher. He will be able to choose from proven as well as modern methods and strategies in physics education.

Class syllabus:
Basic pedagogical documents, standards. Current concepts of teaching physics. Activities in teaching physics and developing students' competencies. Creativity-developing tasks, contextual tasks, project-type tasks. Means for checking and evaluating students' knowledge, creating tests, wide-ranging testing. Work with students with increased interest in physics (physics circles, Correspondence seminar, Physics Olympiad, Tournament of young physicists.) Department of Physics and school agenda. Control of the teaching process. Beginner teacher, school expectations from physics teacher graduates, teacher qualification process.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 76

A	B	C	D	E	FX
94,74	3,95	1,32	0,0	0,0	0,0

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

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-117/10	Databases

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

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in educational activities (15%), project (45%)
Examination: test
Indicative grading scale: A 88 %, B 81 %, C 74 %, D 67 %, E 60 %
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
The student will understand the basic concepts of the field, will have an overview of database models, will understand the problems that can arise when designing databases, will be able to use the SQL language to communicate with a database system, will be able to create a simple database.

Class syllabus:
- Databases around us. Spreadsheet and databases.
- Database system. Database models.
- Conceptual design of a database.
- Relational data model.
- Introduction to SQL.
- Normalization and denormalization, database design criteria.
- Databases and database software

Recommended literature:
• the teacher's own electronic study materials published on the course website or in the Moodle system
• Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika : Úvod do databáz : 1.2 Vzdelávanie nekvalifikovaných učiteľov informatiky na 2. stupni ZŠ a na SŠ / Zuzana Kubincová ... [et al.]. Bratislava : Štátny pedagogický ústav, 2010
• An introduction to database systems / C. J. Date. Boston : Pearson/Addison-Wesley, 2004

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 76

A	B	C	D	E	FX
42,11	19,74	19,74	9,21	6,58	2,63

Lecturers: prof. RNDr. Zuzana Kubincová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-237/22	Design of Educational Multimedia Materials

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: II.

Prerequisites:

Course requirements:
After the first part of the semester, the student chooses a topic for the semester work (10 marks), elaborates (20 marks for preliminary work), submits the semester work (30 marks evaluation of the submitted version) and defends it (10 marks). Peer assessment of the work of colleagues is for 30 marks. To obtain credits, the student must obtain at least 50% marks.

Learning outcomes:
The student will have developed skills to design materials for physics education.

Class syllabus:
Design of the content of the text part, graphic design, stylistics, development of the pillars of the mind (according to Prof. Tokuham-Esponos), curriculum design (according to Klentschy). Approaches to the choice of topic for the elaboration of the semester work. Writing a term paper and defending it against peers.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 19

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-280/19	Didactics Seminar in Informatics (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: 2.

Educational level: II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation in lessons + participation in discussions
Test: -
Indicative rating scale: A 90%, B 80%, C 70%, D 65%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students are able to analyze and evaluate tasks from the point of view of teaching computer science. They can analyze the lesson in terms of required input knowledge, goals, tasks ordering, methodological procedures used.

Class syllabus:
• Discussions about observations during pedagogical practice.
• Demonstrations of teaching topics verified in practice.

Recommended literature:
• Electronic study materials published on the subject's website or moodle system
• Collection of innovative methodologies for the 2nd degree of university, IT Academy, 2020 (in Slovak)
• Varga, M. et al.: Further education of primary school and secondary school teachers in the subject of informatics, Didactics of Informatics at the University, Bratislava: State Pedagogical Institute, 2011 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 28

A	B	C	D	E	FX
75,0	10,71	7,14	3,57	0,0	3,57

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

Last change: 19.02.2025
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-281/22	Didactics Seminar in Informatics (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: 4.

Educational level: II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation in lessons + participation in discussions (60%), analysis of real lesson of informatics for upper secondary pupils (40%).
Indicative rating scale: A 90%, B 80%, C 70%, D 65%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students are able to analyze and evaluate tasks from the point of view of teaching computer science. They can analyze the lesson in terms of required input knowledge, goals, tasks ordering, methodological procedures used.

Class syllabus:
• Discussions about observations during pedagogical practice.
• Demonstrations of teaching topics verified in practice.
• Analysis of teaching lessons and problematic topics from informatics for upper secondary pupils.

Recommended literature:
• Electronic study materials published on the subject's website or moodle system
• Collection of innovative methodologies for the 2nd degree of university, IT Academy, 2020 (in Slovak)
• Lessner, D.: Basics of Informatics for Schools, Jihoče University in České Budějovice, 2020 (in Czech)
• Kalaš et al.: Informatics for Secondary Schools, SPN – Young Summers, 2002 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 15

A	B	C	D	E	FX
66,67	20,0	6,67	0,0	0,0	6,67

Lecturers: doc. RNDr. Ľudmila Jašková, PhD., PaedDr. Mgr. Natália Kováčová, PhD.
Last change: 19.02.2025
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-120/22	Didactics of Informatics (1)

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

Number of credits: 2

Recommended semester: 2.

Educational level: II., N

Prerequisites:

Course requirements:
In-term evaluation: Written assignments, active participation in class, and reports (60 %), didactic outputs, creation and analysis of methodological materials (20 %), study of professional materials (20 %).
The results of problems solved, discussed and active participation in seminars are counted towards the final maximum of 100 points a student can earn. Another regular obligation is weekly writing on the topic studied.
Indicative grading scale: A 90 %, B 82 %, C 74 %, D 67 %, E 60 %
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student acquires a synthesizing view of the issues of teaching informatics and cultivates an overall didactic overview and perception; reflects on the place of informatics in general education, considers the necessary reforms, innovations and obstacles in this context; knows and can compare these contexts in different countries at different stages of development of informatics education; is aware of the differences between the development of digital literacy in education and school informatics - their different and common goals and practices; knows in detail the curricula of the subject informatics at primary and secondary school and its extension forms at secondary school, up to thematriculation (final) exam; knows various didactic procedures for teaching informatics; knows how to deal with various common and specific didactic situations in informatics classes; understands the importance and potential of programming in the implementation of the educational content of other subject areas; knows modern methods of evaluation in informatics; knows various support activities related to informatics education; knows various project and cross-curricular methods suitable for the development of computational thinking; knows modern areas of informatics suitable as attractive topics for secondary school seminars. Thinks about, discusses, and implements productive collaboration between informatics and other subjects.

Class syllabus:
Challenges of modern education, transformation of educational systems in the context of the development of informatics education. General didactics and disciplinary didactics. The role of digital technologies in the process of education and forms of their integration. Digital literacy

and informatics. Different concepts of teaching informatics - at home and abroad. Problems of development of informatics education in different educational contexts. Holistic approach to pupil development and the potential of informatics in it. Modern view of programming and its role in the development of informatics thinking. Educational goals of informatics in different educational systems. Didactic situations in informatics and ways of solving them. Promotion of social constructivism in informatics. Objectives and forms of assessment in informatics education. Forms of cooperation with other teachers and cross-curricular activities.

Recommended literature:

• Kalaš, I. a kol.: Premeny školy v digitálnom veku. Bratislava: Slovenské pedagogické nakladateľstvo, 2013
• the subject lecturerr's own electronic texts
• selection of up-to-date professional materials from the world research literature
• Kalaš, I.: Informatika na križovatke. Didinfo 2021
• up-to-date materials for teaching informatics on the portal of the IT Akadémia and iMyšlení projects, materials of the DVUi project

Languages necessary to complete the course:

Slovak, for the study of some items from the recommended literature, also English as a secondary language

Notes:

Past grade distribution

Total number of evaluated students: 129

A	B	C	D	E	FX
86,05	5,43	2,33	4,65	0,78	0,78

Lecturers: prof. RNDr. Ivan Kalaš, PhD.

Last change: 23.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-219/22	Didactics of Informatics (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: 3.

Educational level: II., N

Prerequisites:

Course requirements:
Written assignments, active participation in class, reports, didactic outputs, creation and analysis of methodological materials, study of professional materials.
The results of problems solved, discussed and active participation in seminars are counted towards the final maximum of 100 points a student can earn. Another regular obligation is weekly writing on the topic studied.
Indicative grading scale: A 92 %, B 84 %, C 76 %, D 68 %, E 60 %
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Learning outcomes:
This course is an immediate continuation and part of the course Didactics of Informatics (1). The student will further develop and deepen the knowledge and skills acquired during the first part of the course. It will delve deeper into the concepts and issues involved in teaching informatics, this semester with a particular emphasis on secondary school. Further develops a synthesizing view of issues in computer science teaching and cultivates overall didactic insight and perception; reflects on the place of informatics in general education, considers needed reforms, innovations and obstacles in this context; knows and can compare these contexts in different countries at different stages of development of informatics education; is aware of the differences between the development of digital literacy in education and school informatics - their different and common goals and practices; knows in detail the curricula of the subject informatics at the primary and secondary school level and its extension forms at the secondary school level, up to the matriculation (final) examination; knows various didactic procedures for teaching informatics; knows how to deal with various common and specific didactic situations in informatics classes; understands the importance and potential of programming in the implementation of the educational content of other subject areas; knows the modern methods of informatics classroom teaching; knows the various support activities related to informatics education; knows the various project and cross-curricular methods suitable for the development of computational thinking; knows the modern areas of informatics suitable as attractive topics for secondary school seminars. Thinks about, discusses and implements productive collaboration between informatics and other subjects

Class syllabus:

Didactic situations in the teaching of informatics at the 2nd level of primary and secondary school. Preparation, implementation and evaluation of the lesson. Comparison of actual curriculum with educational contents in some other countries with developed informatics education. Relationship between methodology and didactics of informatics. Assessment in the subject of informatics, its different forms and functions. Matriculation (final) examination in informatics, matriculation requirements, analysis of matriculation questions. Work in informatics classes with talented pupils. Project teaching in informatics and cross-curricular projects.

Recommended literature:

Recommended literature:

• Kalaš, I. a kol.: Premeny školy v digitálnom veku. Bratislava: Slovenské pedagogické nakladateľstvo, 2013

• the subject lecturerr's own electronic texts

• selection of up-to-date professional materials from the world research literature

• Kalaš, I.: Informatika na križovatke. Didinfo 2021

• up-to-date materials for teaching informatics on the portal of the IT Akadémia and iMyšlení projects, materials of the DVUi project

Languages necessary to complete the course:

Slovak, for the study of some items from the recommended literature, also English as a secondary language

Notes:

Past grade distribution

Total number of evaluated students: 118

A	B	C	D	E	FX
88,14	6,78	4,24	0,0	0,0	0,85

Lecturers: prof. RNDr. Ivan Kalaš, PhD.

Last change: 23.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/2-UFY-961/15	**Course title:** Didactics of Physics
Number of credits: 3	
Educational level: II.	

Course requirements:

The final examination is realized by the student's discussion with the members of the commission on two topics from the content exams. Assessed: illustration of concepts on suitable examples / contexts / situations 0-3 points;
correctness of physical terminology 0-3 points; intelligibility of statements 0-3 points; responding to Commission questions concerning selected heading 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:

The graduate is ready to perform the tasks assigned to a beginning physics teacher.

Class syllabus:

Movement and force, movement on a circle. Movement of a mass point along a circle. Movements of bodies in the homogeneous gravitational field of the Earth from a kinematic point of view.
Movement and force, impulse of force and change of momentum Newton's laws of motion. Static and dynamic friction force during shear friction on a horizontal surface. Inclined plane, without friction, with friction. Momentum and impulse of force. The law of conservation of momentum.
Mechanical work, mechanical energy. The work of constant force. Variable force work - from a graph of force versus time. Working when stretching a linear spring. Potential energy of the body in a homogeneous gravitational field. Potential energy of the body in the radial gravitational field of the Earth. Kinetic energy of sliding motion. Mechanical energy conservation law.
Rigid body. Center of gravity. Equilibrium positions. Moment of force. Moment sentence. Simple machines - lever, pulley. Body stability.
Kinetic energy of a rotating body. The moment of inertia of a rigid body. Momentum. Momentum conservation. Steiner's theorem.
Radial gravitational field of the Earth. Newton's general law of gravitation. Movement of a body in a radial gravitational field, kinetic and potential energy of a body moving in a radial gravitational field. Geostationary satellite.
Fluid statics. Pressure. Hydrostatic pressure. Archimedes' law. Atmospheric pressure, changes in pressure and air density with altitude. Atmospheric pressure measurement.
Ideal fluid flow. Continuity equation. Bernoulli's equation for horizontal flow and for flow with vertical cant.
Heat and temperature. Mass heat capacity. Changes in energy states. Calorimetric equation.
It happens in an ideal gas, equation of state. Isothermal plot. Isobaric story. Isochoric plot. Adiabatic story. Equation of state of an ideal gas.
Electric voltage, electric current, electric resistance. Electromotive and terminal supply voltage. Work and power of direct current. Short circuit in electrical circuit.

DC circuit. Voltage and current measurement. Ohm's law for a part of an electrical circuit. The resulting resistance of resistors connected in series and side by side. Kirchhoff's laws. Dependence of conductor resistance on its temperature and dimensions. Volt-ampere characteristic of resistor and filament lamp.
Stationary magnetic field. Description of the magnetic field. Magnetic field of a permanent magnet. Magnetic field of a conductor with electric current. Electromagnet. Force of magnetic field on current conductor. Mutual force action of two conductors with current.
Unsteady magnetic field. Electromagnetic induction. Lenz's law. Transformation of alternating voltages. Power plant model, transmission system.
Oscillating movement. Spring oscillator. Mathematical pendulum. Relationship between harmonic oscillation and uniform motion along a circle. Kinematics and dynamics of the mentioned oscillators, graphs of dependences of instantaneous values of quantities describing oscillating motion from time and from instantaneous deviation from equilibrium position.
Waves. Equation of successive mechanical wave. Wave interference. Standing waves on a stretched fiber. Sound and its properties. Sound speed measurement.
Light and its properties. Light as an electromagnetic wave. Determination of water refractive index. Wave properties of light. Decomposition of light by a prism and an optical grating. RGB, CYM.
Atomic physics. Continuous and line emission and absorption spectra. Photoelectric effect, X-rays, origin and properties. Thomson's discovery of the electron. Rutherford's experiment.
Nuclear Physics. Radioactivity, half-life, fission and fusion.
Distances in space and basic concepts of stellar evolution.
Theoretical methods of cognition - classification, analytical-synthetic method, inductive-deductive method, analogy; Empirical methods of cognition - observation in physics education, developing students' skills associated with observation and communicating the results of observation; Empirical methods of cognition - measuring the values of a physics quantity, direct and indirect measurement; Empirical methods of cognition - measuring the interdependence of physical quantities; Empirical methods of cognition - experiment - student activity; Empirical methods of cognition - experiment - teacher planning; Classification of school experiments; Teaching methods - contextual teaching; Communication methods in school physics - graph linearization; Theoretical methods of cognition - graphic integration; Experiments and experiments with simple tools - their role and examples; Physics problem - formative function of a physics problem; Physics task - the function of the physics task in summative evaluation; The role of the teacher and the role of the student in physics education; Objectives of physics education; Defining the content of physics education curriculum. Application of interdisciplinary relationships in teaching physics. Realization of cross-curricular goals by physics education; Formal, non-formal and informal physics education.

State exam syllabus:

Recommended literature:
Literature recommended by subjects of master's study.
Physics textbooks for lower and higher secondary schools.
Selected foreign physics textbook.
Documents of the selected educational system.

Languages necessary to complete the course:
Slovak and English.

Last change: 12.11.2021

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-104/22	Didactics of 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: 1.

Educational level: II., N

Prerequisites:

Course requirements:
During the semester, there will be two written examinations, from which the student can obtain max. 2x 15 marks. 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 and lab reports (2x10 marks). In the exam period, there will be a structured discussion, where the student can get max. 20 marks. Credits will not be awarded if the student scores less than 50% of the marks.

Learning outcomes:
Graduates will look at teaching physics from a teacher's perspective. They will know the goals, methods and styles of teaching physics.
Graduates will know commercially available and used teaching equipment; they will use them appropriately. They will be able to carry out experiments with simple tools and the use of modern technology and with the help of digital technologies. They will be able to plan lessons in which empirical methods are applied, both a teacher demonstration experiment and, in particular, a student heuristic experiment.

Class syllabus:
Physics didactics and teacher training. Knowledge system and its structure. Cognition in cycles. Conditions necessary for the child to learn. Ways to support learning (scaffolding). Physics knowledge and teaching physics. Cognition, methods of cognition. Models and modelling in physics education. The function of experiments in physics education. Observation and measurement. Physical procedures in teaching science subjects. Solution and function of physical problems in teaching. Objectives of teaching physics.
Experiments and experiments mainly in the fields of geometric and wave optics, atomic physics.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 102

A	B	C	D	E	FX
57,84	26,47	8,82	4,9	0,98	0,98

Lecturers: doc. PaedDr. Viera Haverlíková, PhD., PaedDr. Peter Horváth, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-106/15	Didactics of Physics (2)

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

Number of credits: 3

Recommended semester: 2.

Educational level: II., N

Prerequisites:

Course requirements:
Continuous assessment: seminar activities (4x10 marks)
Exam: written (60 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 developed skills needed in creating a lesson in physics, choosing the goals of the lesson, ways and means of fulfilling these goals. They will also have developed personal qualities, support for the assertive behavior and communication skills of the future physics teacher.

Class syllabus:
From learning sequence, through the topic in teaching to the thematic unit.
Objectives of teaching physics at primary and secondary school.
Physics as a part of science education and as a part of technology basics.
Specifics of teacher's work in non-formal education (physics circle, club, physical competitions), non-formal education of students outside school.
Examples of teaching sequences and topics for analysis are mainly in the areas of electromagnetic induction, mechanical and electromagnetic waves, geometric and wave optics.

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
68,24	21,18	7,06	2,35	1,18	0,0

Lecturers: doc. PaedDr. Viera Haverlíková, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-108/15	Didactics of Programming (1)

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

Number of credits: 3

Recommended semester: 1.

Educational level: II., N

Prerequisites:

Course requirements:
Continuous assessment: The student can get 50% of points for the preparation of topics for computer science lessons, another 25% of points for the preparation of detailed methodological material for teachers. He can get the remaining 25% of points for the didactic output.
Indicative assessment scale: A 92%, B 84%, C 77%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students are able to analyze and evaluate programming languages, environments, textbooks and other materials from the perspective of programming didactics. They will compile and implement a lesson focused on programming in primary school with regard to the stages of the cognitive process.

Class syllabus:
• Programming languages and environments in terms of programming didactics
• Basic programming constructions and their order in teaching programming for different programming languages
• Programming in the state educational program
• Teaching programming in primary school
• Didactics of teaching the topic of sequence of commands
• The topic of the cycle and various didactic procedures of its teaching
• Variables and students' ability to understand their meaning and how they are used in programming
• Construction of a conditional statement in programming languages, logical conditions and didactic procedures suitable for mastering a conditional statement
• Testing students in teaching programming
• The importance of student evaluation in didactics, project teaching, peer evaluation of programming projects

Recommended literature:
• The teacher's own electronic study materials published on the subject's website, resp. in Moodle
• Ľubomír Salanci [et al.] Programming Didactics 1: Further education of qualified computer science teachers at the 2nd level of primary school and at secondary school. - 1st ed. - Bratislava:

Štátny pedagogický ústav, 2010. - 36 s. - (In-service training of primary and secondary school teachers in computer science)
• Ľubomír Salanci [et al.]: Didactics of programming 2: Further education of qualified computer science teachers at the 2nd level of primary and secondary schools. - 1st ed. - Bratislava: Štátny pedagogický ústav, 2010. - 36 s. - (In-service training of primary and secondary school teachers in computer science)
• Vaníček, J., Nagyová, I., Tomcsányiová, M .: Programming in Scratch for the 2nd level of primary school. University of South Bohemia in České Budějovice, 2020. • Černochová, M., Vaňková, P., Štípek, J .: Scratch programming for advanced - projects for the 2nd grade of primary school. University of South Bohemia in České Budějovice, 2020.

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 76

A	B	C	D	E	FX
68,42	23,68	6,58	1,32	0,0	0,0

Lecturers: PaedDr. Mgr. Natália Kováčová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-109/22	Didactics of Programming (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: II., N

Prerequisites:

Recommended prerequisites:
2-UIN-108/22 Didactics of Programming (1)

Course requirements:
Interim evaluation: active participation (20%), homeworks (40%), didactic presentation (40%)
Test: -
Indicative rating scale: A 92%, B 84%, C 77%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students are able to analyze and evaluate algorithmic tasks from the point of view of didactics of programming. They design and implement a didactic sequence of steps to support students solving an algorithmic problem. They will design and implement a lesson (possibly a sequence of lessons) focused on programming in secondary school with regard to the stages of the cognitive process and bloom taxonomy.

Class syllabus:
• Programming in the official curriculum – programming in lower grades of grammar school and programming as part of the greduate examination
• Cognitive process and Bloom taxonomy of educational goals – applications in teaching programming
• Analysis of programming languages and environments in terms of their suitability for teaching programming
• Textbooks and methodological materials
• Different approaches to teaching programming
• Abstraction levels in solving a complex algorithmic task
• Creation and analysis of tasks from programming for the graduate exam and evaluation of the student's knowledge at the graduate exam.
• Ordering of topics in the field of Algorithmic problem solving and their teaching in individual years of upper secondary education

Recommended literature:

• Electronic study materials published on the subject's website or moodle system
• Salanci, Ľ. A kol.: Didactics of programming for SS 1, Further education of primary and secondary school teachers in the subject of informatics, Bratislava: l State Pedagogical Institute, 2011 (in Slovak)
• Salanci, Ľ. A kol.: Didactics of programming for SS 2, Further education of primary and secondary school teachers in the subject of informatics, Bratislava: l State Pedagogical Institute, 2011 (in Slovak)
• Blaho, A. et al.: Programming in the Python for secondary schools (in Slovak)
• Mészárosová, E.: PYTHON AND TURTLE GRAPHIC, Methodological material for teaching the basics of programming for gymnasiums, Library and Publishing Centre FMFI UK, Bratislava, 2017 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 61

A	B	C	D	E	FX
57,38	16,39	11,48	4,92	4,92	4,92

Lecturers: doc. RNDr. Ľudmila Jašková, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG+KDMFI/2-UXX-991/22	Diploma Thesis Defense

Number of credits: 10

Educational level: II.

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

Learning outcomes:
The student is able to work on the chosen topic at the level of scientific study with a representative selection of professional literature, with appropriately selected scientific procedures and hypotheses that can be verified. The diploma thesis is a contribution in the relevant field of study.

Class syllabus:
1. The contribution of the final work for the given field of study depending on its nature and degree of study. The evaluation of the diploma thesis takes into account whether the student adequately processes the selected topic at the level of scientific study with a representative selection of professional literature, whether the chosen scientific procedures are appropriate and appropriate, and whether he adequately works with hypotheses that can be verified. The diploma thesis should be a clear contribution in the relevant field of study;
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 diploma thesis is usually 50 - 70 standard pages - 90,000 to 126,000 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 master thesis.

Languages necessary to complete the course:

Slovak, English
Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI+KAG/2-UXX-939/22	**Course title:** Diploma Thesis Seminar
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: 3	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Course requirements: Active participation, ongoing reporting on work on the thesis. A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Definition of the thesis topic, overview of the current state of problem solving, choice of the theoretical-methodological concept of the thesis and the ability to work selectively and correctly with secondary literature.	
Class syllabus: Choice of thesis topic. Review of literature on the topic. Basic material research and the procedure of its processing. Methods of processing and producing the thesis (citation standards, manuscript editing, note-taking apparatus). Presentation of a partial output (e.g. in the form of one chapter of the thesis).	
Recommended literature: Selection of literature according to the chosen topic of the thesis; The current directive of the Rector of Comenius University on the basic requirements of theses; KATUŠČÁK, D.: Ako písať záverečné a kvalifikačné práce. Nitra: Enigma 2007.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution
Total number of evaluated students: 64

A	ABS	B	C	D	E	FX
92,19	0,0	3,13	1,56	1,56	1,56	0,0

Lecturers: prof. RNDr. Zuzana Kubincová, PhD., doc. RNDr. Pavel Chalmovianský, PhD., doc. PaedDr. Peter Vankúš, PhD., doc. PaedDr. Klára Velmovská, PhD., prof. RNDr. Ivan Kalaš, PhD., Mgr. Jana Havlíčková, PhD., Mgr. Marcel Makovník, PhD.

Last change: 22.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-940/22	Diploma Thesis Seminar (1)

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: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
active participation in the seminar, on time submission of assignments and presentation of preliminary results
A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate of the course is able to obtain and sort information from information sources, especially from monographs, journal articles, conference proceedings and university textbooks. The graduate is able to plan research in the area of the thesis.

Class syllabus:
Formulating the objectives of the thesis on the basis of its assignment; obtaining, sorting and using available resources; working with electronic information sources; formulating research questions, searching for research methods suitable for the topic of the thesis.

Recommended literature:
Creswell JW. Educational research: Planning, conducting, and evaluating quantitative. Prentice Hall Upper Saddle River, NJ; 2002.
Sources listed in the thesis assignment.
Sources available in databases (e.g. wos, scopus, researchgate).
Textbook on research methodology in science teaching recommended by the thesis supervisor.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
96,3	0,0	0,0	0,0	1,85	1,85

Lecturers: doc. PaedDr. Mária Slavíčková, PhD., prof. RNDr. Zuzana Kubincová, PhD., doc. PaedDr. Klára Velmovská, PhD., doc. RNDr. Pavel Chalmovianský, PhD., doc. PaedDr. Peter Vankúš, PhD., RNDr. Martina Bátorová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-941/22	Diploma Thesis Seminar (2)

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

Number of credits: 4

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:
Active participation, ongoing reporting on work on the thesis.
A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate is able to elaborate the chosen topic at the level of a scientific study with a representative selection of literature, with appropriately chosen scientific procedures and hypotheses that can be verified. The graduate is able to formulate the contribution of his/her own work in the field of informatics/mathematics/physics teaching.

Class syllabus:
Development of argumentation skills, causal thinking and creativity in the area of the thesis topic.
Development of abilities to present the results of own work in the field of the thesis topic.

Recommended literature:
Creswell JW. Educational research: Planning, conducting, and evaluating quantitative. Prentice Hall Upper Saddle River, NJ; 2002.
Sources listed in the thesis assignment.
Sources available in databases (e.g. wos, scopus, researchgate).
Textbook on research methodology in science teaching recommended by the thesis supervisor.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 36

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

Lecturers: doc. PaedDr. Mária Slavíčková, PhD., doc. RNDr. Peter Demkanin, PhD., prof. RNDr. Zuzana Kubincová, PhD., doc. RNDr. Pavel Chalmovianský, PhD., doc. PaedDr. Peter Vankúš, PhD., RNDr. Martina Bátorová, PhD.
Last change: 20.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KEF/2-UFY-212/22	Electronics and Communication for Teachers

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

Number of credits: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: individual work (30 marks), evaluation of micro-outputs at the seminar (2x15 marks)
Exam: test (20 marks), presentation of individual work results (20 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:
The graduate will understand the basic concepts of electronics, signal digitization and the physical nature of information transmission. The graduate will know the ways of including topics from the physical foundations of communication and electronics in the curriculum of primary and secondary schools in the selected foreign education system.

Class syllabus:
Implementation of simple experiments using basic electronic components. Analysis of possible directions of expansion and updating of the content of the current curriculum of physics of primary and secondary school in the field of electromagnetism (electromagnetic waves and signal transmission), optics (optical fibers) circuits with electric current (classification of electronic elements).

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 75

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

Lecturers: doc. RNDr. František Kundracik, CSc., PaedDr. Lukáš Bartošovič, PhD.
Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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-130/21	Elements of AI

Educational activities:
Type of activities: independent work
Number of hours:
per week: 25 **per level/semester:** 325
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 7.

Educational level: I.II., II.

Prerequisites:

Course requirements:
Passing the online course https://course.elementsofai.com/ (in Enlish or Slovak version).

Learning outcomes:
The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.

Class syllabus:
1. What is artificial intelligence: related areas, AI philosophy.
2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games
3. Probability and chance, Bayes' theorem, naive Bayesian classification.
4. Machine learning: nearest neighbor classifier, regression.
5. Neural networks: basics, creation, modern techniques.
6. Consequences: on predicting the future, the effects of AI on society, summary.

Recommended literature:
Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library.
Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.

Languages necessary to complete the course:
Slovak or English

Notes:
The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.

Past grade distribution
Total number of evaluated students: 95

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

Lecturers: doc. RNDr. Mária Markošová, PhD.

Last change: 22.08.2021
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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-130/21	Elements of AI

Educational activities:
Type of activities: independent work
Number of hours:
per week: 25 **per level/semester:** 325
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2., 8.

Educational level: I.II., II.

Prerequisites:

Course requirements:
Passing the online course https://course.elementsofai.com/ (in Enlish or Slovak version).

Learning outcomes:
The student will get acquainted with selected basic concepts of artificial intelligence and their use in solving various practical tasks.

Class syllabus:
1. What is artificial intelligence: related areas, AI philosophy.
2. Troubleshooting and UI: Browsing and troubleshooting, browsing and games
3. Probability and chance, Bayes' theorem, naive Bayesian classification.
4. Machine learning: nearest neighbor classifier, regression.
5. Neural networks: basics, creation, modern techniques.
6. Consequences: on predicting the future, the effects of AI on society, summary.

Recommended literature:
Russell S., Norwig P. (2010). Artificial Intelligence: A Modern Approach, (3rd ed.), Prentice Hall. Available in faculty library.
Marsland S. (2015). Machine Learning: An Algorithmic Perspective, (2nd ed.), CRC Press.

Languages necessary to complete the course:
Slovak or English

Notes:
The course consists of 20 numerical and 5 text-based tasks. Numerical tasks are checked automatically, text-based tasks are evaluated anonymously by students.

Past grade distribution
Total number of evaluated students: 95

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

Lecturers: doc. RNDr. Mária Markošová, PhD., prof. Ing. Igor Farkaš, Dr., doc. RNDr. Martin Takáč, PhD.
Last change: 22.08.2021
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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: 1., 3., 7., 9.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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: 2., 4., 8., 10.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-242/22	Environmental Physics 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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Each student will present a separate paper during the semester. Outputs are assessed. In particular, the correctness of the physical information used is assessed (70%). Assessment of peers is for 30%. Indicative rating scale: A 90%, B 80%, C 70%, D 60%, E 50%. Credits will not be awarded if the student scores less than 50%.

Learning outcomes:
Graduates will be acquainted with the laws of physics and regularities that are related to environmental problems, focusing in particular on current environmental problems and alternative energy sources.

Class syllabus:
Solar constant, global climate change. Conventional and alternative energy sources. Lighting, light smog.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 21

A	B	C	D	E	FX
100,0	0,0	0,0	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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-131/22	Financial Literacy for Everyone

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: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in seminars / elaboration of assignments
An exam:
Indicative evaluation scale: e.g. A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student:
- knows the target requirements for a financially literate student
- propose activities and be able to assess their suitability
- can solve and prepare his / her own tasks in every topic of financial literacy.

Class syllabus:
- National standard financial literacy
- Origin and development of money;
- Financial responsibility of consumers;
- Planning, receiving and working;
- Consumer decision-making and management;
- Credit and debt;
- Saving and investing;
- Risk management and insurance;

Recommended literature:
FFinancie v praxi A / Peter Tóth, Monika Dillingerová, Bratislava : ABCedu, a.s. 2019
Financie v praxi B / Peter Samuel Tóth, Monika Dillingerová, Bratislava : ABCedu, a.s. 2021,
Financie v praxi C / Peter Samuel Tóth, Monika Dillingerová, Bratislava : ABCedu, a.s. will be printed soon
my own electronic texts published on a website in LMS Moodle

Languages necessary to complete the course:
slovak

Notes:

Past grade distribution
Total number of evaluated students: 59

A	B	C	D	E	FX
98,31	0,0	0,0	0,0	0,0	1,69

Lecturers: RNDr. Monika Dillingerová, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 7.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 8.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 9.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 10.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 7.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 8.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 9.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 10.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-108/00	History 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: 2.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in class, presentation
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will know the basic milestones in the history of storing, transmitting and processing information from antiquity to the present day, as well as a brief history of computer science.

Class syllabus:
• History of storage, transmission and processing of information (various storage media: stone, clay, papyrus, parchment, paper, magnetic record;
• information transmission: messenger, sound and light signals, wire telegraph I wireless, radio, television, internet;
• information processing: fonts, positional systems, analog aids, the first calculators, the idea of a universal computer, digital machines, the first electromechanical and electronic computers, a brief look at the development of computer technology after the Second World War).
• History of informatics: algorithm, development in mathematics that influenced informatics: algebra, variables, mathematics mathematics, development of analysis, logic, decidability, computability, efficiency.
• Brief overview of the history of computer technology and informatics in Slovakia (within Czechoslovakia)

Recommended literature:
- Teacher's own electronic study materials published on the course website or in the Moodle system
- Gruska, Havel, Zelený, Wiedermann. Počítačová revolúcia, Sofsem 1984

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 94

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

Lecturers: RNDr. Michal Winczer, PhD., prof. RNDr. Ivan Kalaš, PhD.

Last change: 17.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/2-UIN-951/15	**Course title:** Informatics and Didactics of Informatics
Number of credits: 3	
Educational level: II.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.	

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-268/22	Information Systems

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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Interim evaluation: Solving specified tasks (85%) + contributions to discussion forums, project development (15%)
Exam: -
Indicative rating scale: A 90%, B 80%, C 70%, D 65%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students will understand the basic concepts in the field of information systems. They will know the different types of information systems used in different institutions and at different levels of management. They will gain practical experience in the use of existing information systems, with particular emphasis on school information systems. Students learn to specify and assess their characteristics. They will briefly familiarize themselves with the process of designing, creating and maintaining the information system.

Class syllabus:
• The information society and its development in the history of mankind
• System and model of the system, information system and its characteristics
• Information systems at different levels of management (transaction systems, management systems, decision support systems, information systems for top management, business intelligence systems)
• Information systems applications (school IS, geographic IS, business IS)
• Design, development and maintenance of information systems (examples from practice).

Recommended literature:
• Electronic study materials published on the subject's website or moodle system
• Stair, R.,Reynolds G.: Principles of Information Systems, Thirteanth Edition, Thomson Course Technology, Boston, 2018, ISBN-10: 9781305971776.....
• Mihók P., Révészová, L.: Information Systems for Economists, Faculty of Economics of the Technical University of Košice, 2006, ISBN 80-8073-497-6 (in Slovak)
• Buchalceva, A.: Methodology of Information Systems Building, Oeconomica, 2009 , ISBN: 9788024515403 (in Slovak)

• Kalaš I. et al.: School transformations in the digital age, SPN - Young Summers, Bratislava, 2013, ISBN: 9788010024094 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 29

A	B	C	D	E	FX
82,76	10,34	3,45	0,0	3,45	0,0

Lecturers: doc. RNDr. Ľudmila Jašková, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.CENAM/2-MXX-134/26	Innovation and Entrepreneurship in Natural and Technical Sciences

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

Type, volume, methods and workload of the student - additional information
2/1 (lecture / individual work)

Number of credits: 3

Recommended semester: 1., 7.

Educational level: I.II., II.

Prerequisites:

Course requirements:
The condition for admission to the exam is active participation in at least 80% of the lessons.
The final assessment consists of a presentation of the semester project. To successfully complete the course, it is necessary to achieve at least 50% of the overall score.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students can describe the possibilities for commercialization of scientific and technological research. They can identify market needs, assess the market potential of a technological solution, and are familiar with the terminology of entrepreneurship, technology transfer, and intellectual property protection. They understand the overall structure of a business plan and the main forms of financing for technological projects. They are familiar with the principles of communication, teamwork, and team leadership and can apply them appropriately in project work and its presentation.

Class syllabus:
1. Commercialization of scientific research.
2. Fundamentals of entrepreneurship and startup terminology.
3. Identification of problems and customer needs analysis (design thinking).
4. Technology transfer. Technology Readiness Levels (TRL).
5. Intellectual property and its protection.
6. Market, customer, and market potential of a technological solution.
7. Business Model Canvas. Revenue models.
8. Sources of financing for technological projects.
9. Pitching and communication of the solution.
10. Fundamentals of management and leadership.
11. Innovation support and incubation structures at national and international levels.

Recommended literature:
Clark, Timothy R., et al. Business Model Generation. Wiley, 2010

Languages necessary to complete the course:
Slovak

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. Tomáš Plecenik, PhD., Mgr. Veronika Hidaši Turiničová, PhD.

Last change: 13.03.2026

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAI/2-MXX-131/21	International Team-based Research Project

Educational activities:
Type of activities: course / independent work
Number of hours:
per week: 3 **per level/semester:** 39 / 30s
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1., 7.

Educational level: I.II., II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in research in an international student team (25%), presentation of work in a workshop (25%), scientific article (50%)
Indicative evaluation scale: A 90 %, B 80 %, C 70 %, D 60 %, E 50 %
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will learn in the team to agree on a common research topic, formulate research questions, determine research methods for the problem, collect and evaluate data, discuss their findings, present research results to the professional public, analyze and evaluate the scientific work of their colleagues, prepare a scientific article suitable for publication

Class syllabus:
- Research methodology
- Design and implementation of a research project in an international group (preferably interdisciplinary)
- Methods and tools for collaboration in virtual space, collaboration in science and practice
- Academic writing, presentation of research results through scientific articles; objectives, content and structure of scientific articles; forms of academic publication, publication forums and evaluation of their quality
- Quality assurance and feedback - peer review
- Communication of results through posters or conference presentations

Recommended literature:
- Teachers' own electronic study materials published on the course website or in the Moodle system
- Gavora, Peter a kol. 2010. Elektronická učebnica pedagogického výskumu. [online]. Bratislava : Univerzita Komenského, 2010. Dostupné na: http://www.e-metodologia.fedu.uniba.sk/ ISBN 978–80–223–2951–4.

- Tharenou, P., Donohue, R. and Cooper, B., 2007. Management research methods. Cambridge University Press.
- Topping, A., 2015: The Quantitative-Qualitative Continium. In: Gerrish, K. and Lathlean, J., The Research Process in Nursing, p. 159-172
- Williamson, K. and Johanson, G. eds., 2017. Research methods: Information, systems, and contexts. Chandos Publishing.

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
70,0	0,0	0,0	0,0	30,0	0,0

Lecturers: prof. RNDr. Zuzana Kubincová, PhD., doc. RNDr. Martin Homola, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-356/22	Introduction to Artificial Intelligence

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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Interim evaluation: Active participation in lessons + participation in discussions (50%), design of methodology for one topic in the field of artificial intelligence (suitable for secondary education students) and its presentation (50%).
Test: -
Indicative rating scale: A 90 %, B 80 %, C 70 %, D 65 %, E 60 %)
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students are able to prepare and implement attractive and age-appropriate educational activities in the field of artificial intelligence with secondary students. They will be able to discuss with students various aspects of the use of artificial intelligence in devices they know from everyday life.

Class syllabus:
• Artificial intelligence as a topic in the curriculum
• Classification by decision trees
• Machine learning or pattern recognition using neural networks
• Computer as a smart player in computer games
• Search for patterns in large amounts of data
• Turing test or how do we know if we are talking to a machine

Recommended literature:
• Electronic study materials published on the subject's website or moodle system
• Collection of innovative methodologies for RS (artificial intelligence section), IT Academy, 2020 (in Slovak)
• Lindner, A. et al.: Unplugged Activities in the Context of AI, In: ISSEP 2019
• Spano, M. Artificial Intelligence in a Nut Shell, Živé.sk, 2019 (in Slovak)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 3

A	B	C	D	E	FX
33,33	0,0	66,67	0,0	0,0	0,0

Lecturers: doc. RNDr. Ľubomír Salanci, PhD., doc. RNDr. Ľudmila Jašková, PhD., Mgr. Mária Čujdíková, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-125/22	Methodology of Pedagogical Research

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: II.

Prerequisites:

Course requirements:
Attendance at lectures is not necessary, but recommended. (20%)
The exercises evaluate active work, solving tasks such as. coding, analysis and data collection, etc. and solving beds at home. (60%)
The course is completed by a research project (20%)
The condition for successful completion of the course is to obtain at least 60% of the maximum possible evaluation of the course. 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): 80/20

Learning outcomes:
At the end of the semester, students will receive:
Knowledge of basic stages and methods of empirical research of educational phenomena, basic methodological concepts, stages, methods and principles of quantitative and qualitative pedagogical research.
Skills needed to study and analyze scientific studies in pedagogy.
The teacher is able to design his / her own educational research, survey or action research and, with the support of the trainer, to carry out an independent research effort.
Ability to choose appropriate and meaningful research topics, deftly develop a research project, collect and empirically correct analysis of research data. They can interpret, defend and publish research data meaningfully and creatively.
Ability to critically evaluate various pedagogical researches, their implementation and their results. They can create and choose the right type of research, with regard to solving a problem in the teaching process. They are able to create, implement and evaluate a test of knowledge and skills, according to the rules of creation and with regard to educational goals.

Class syllabus:

Research of educational phenomena. Action research as a specific professional activity of a teacher. Stages of empirical educational research. Procedures and techniques of research of educational phenomena (experiment, observation, scales and scaling, interview, questionnaire, sociometry and measurement of social climate, method of content analysis of school documents).
Qualitative research (characteristics, principles, use), collection of qualitative data (tools, conditions, tool creation), processing and interpretation of qualitative data (transcription, coding, theory creation, use), quantitative research (characteristics, principles, use), collection of quantitative data data (tools, conditions, tool creation), processing and analysis of quantitative data. (statistical methods, types, application, use), objectivity, reliability and validity of research, designs of qualitative, quantitative and mixed pedagogical research

Recommended literature:

PROKŠA, M., HELD, Ľ. et al .: Methodology of pedagogical research and its application in didactics of natural sciences. Bratislava: Comenius University, 2008.
CHRÁSKA, M .: Methods of pedagogical research.Prague, Grada, 2007.
SILVERMAN, D .: How to do qualitative research. Bratislava, Ikar, 2005.
GAVORA, P .: Introduction to pedagogical research. Bratislava: UK, 1996, 1999, 2001, 2008.
GAVORA, P .: A Guide to Qualitative Research Methodology. Bratislava: UK, 2007.
MAŇÁK, J. - ŠVEC, V .: Ways of pedagogical research. Brno: Paido, 2004.
PELIKÁN, J .: Basics of empirical research of pedagogical phenomena. Prague: Karolinum, 1998, 2004, 2007.
ŠVEC, Š. et al .: Methodology of educational sciences. Quantitative-scientific and qualitative-humanities approaches. Bratislava: Iris, 1996. 2nd ed. Brno: Paido, 2009.
GAVORA, P. et al. 2010. Electronic textbook of pedagogical research methodology. (Online). Bratislava: Comenius University in Bratislava, 2010. Available online. ISBN 978-80-223-2951-4.
STRAUSS, A., CORBINOVÁ, J. 1999. Basics of qualitative research. Procedures and techniques of grounded theory. Boskovice: Nakladatelství Albert, 1999, 196p. ISBN 80-85834-60-X.
ŠEĎOVÁ, K., ŠVAŘÍČEK, R., 2007. Qualitative research in pedagogical sciences. Prague: Portal, 2007, 377 p. ISBN 978-80-7367-313-0.
ŠVAŘÍČEK, R - ŠEĎOVÁ, K .. et al .: Qualitative research in pedagogical sciences. Game rules. Prague: Portal, 2007
J.W. CRESWELL: Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research: International Edition. Pearson Education (US) 2011
J.W. CRESWELL, V.L. Plano CLARK .: Designing and Conducting Mixed Methods Researc. SAGE Publications Inc, 2017

Languages necessary to complete the course:

Slovak

Notes:

Past grade distribution

Total number of evaluated students: 203

A	B	C	D	E	FX
68,97	15,76	6,9	3,94	1,48	2,96

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-115/15	Methods for Solving Physics Problems

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: 3

Recommended semester: 2.

Educational level: II., N

Prerequisites:

Course requirements:
Continuous assessment: homeworks (4x10 marks), discussions (3x10 marks), tests (2x15 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:
The graduate will know several forms of physical problems, selected methods of assigning and solving physical problems and methods of evaluating students' solutions to physical problems. Will be able to actively use physics tasks in secondary school.

Class syllabus:
Physics task, physics problem. Assignment. The general plan of the process of solving. Modelling in solving a physical problem. Mathematization of the task situation. Graphic and numerical solution of the problem. Dynamic modelling method. Solution methods using computer programs and audiovisual means. Solution methods using the system of computer-assisted science laboratory Coach.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 87

A	B	C	D	E	FX
89,66	5,75	4,6	0,0	0,0	0,0

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-144/22	Methods of Creating Efficient Algorithms

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: homework (50%), active participation (50%)
Homework: the student chooses one of the assigned tasks and writes it out in writing.
Active participation: In the class, students present their solutions to others, resp. the presenter tries to simulate with others who did not solve the given task, as if they were high school students
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will be acquainted with the methods of creating efficient algorithms and will be able to design and use algorithms for selected problems.

Class syllabus:
• Complexity of algorithms, complexity analysis
• Methods of creating efficient algorithms (divide and conquer, greeds, dynamic programming, methods based on state space search)
• Search for a pattern in the text
• Graph algorithms
• Algorithms for NP difficult problems - probabilistic, approximate

Recommended literature:
• Zbierka úloh Korešpondenčného seminára z programovania (1983-1997) / Michal Winczer. Bratislava : Metodické centrum, 1997
• Zbierka úloh Korešpondenčného seminára z programovania 1983-2001 / Zostavovateľ Michal Winczer. Bratislava : Fakulta matematiky, fyziky a informatiky UK, 2001
• Teacher's own electronic study materials published on the course website or in the Moodle systeme

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 25

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

Lecturers: RNDr. Michal Winczer, PhD., prof. RNDr. Zuzana Kubincová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-246/22	Methods of School Experiment

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
During the semester, students will prepare five written preparations and make at least five micro-presentations. (5x20 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:
After completing the course, the student will be prepared for active management planning and support of empirical physics cognition by high school students. He will be able to appropriately select and implement activities with students in the field of observation, measurement and physics experiments.

Class syllabus:
Demonstrations, school experiments and experiments on the topics of force and motion, periodic events, mechanical oscillations and waves, rigid body mechanics, fluid mechanics, hydrostatics.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 3

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: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-238/15	Mobile Platform Programming for Secondary Schools

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: 3.

Educational level: II.

Prerequisites:

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

Learning outcomes:
After completing the course the student
• has an overview of programming environments that are suitable for programming applications for mobile platforms
• is able to recognize which environment is suitable for high school students
• knows and is able to apply knowledge of other programming languages in a language that is suitable for programming mobile devices
• is able to assess which applications in the selected programming tool are suitable and reasonably demanding for high school students
• programs moderately demanding projects in the selected environment

Class syllabus:
• Programming languages and environments for mobile devices
• Overview of mobile platforms and programming approaches for them
• Programming tools for programming mobile applications that are suitable for high school students.
• Multi-platform development environment versus platform-specific development environment
• Cycle and its use in the selected programming language
• Create and use variables in simple tasks for mobile devices
• Conditional statement construction
• Project specification and design
• Project implementation, debugging
• Project presentation, evaluation and project discussion

Recommended literature:
The teacher's own electronic study materials published on the subject's website, resp. in Moodle

Beginning Android 4 application development / Wei-Meng Lee; Chaim Krause. Indianapolis, Ind. : Wrox / John Wiley & Sons, 2012
MIT App Inventor, website and educational materials from www.appinventor.mit.edu

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 16

A	B	C	D	E	FX
56,25	25,0	6,25	0,0	0,0	12,5

Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD.

Last change: 20.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UMA-114/22	Non-traditional Forms of Teaching

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: II., N

Prerequisites:

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

Learning outcomes:
Students will be able to distinguish between different methods of education. They will have an overview of the principles and principles of each method and will be able to apply these principles in practice.

Class syllabus:
Flipped Classroom, Cooperative teaching, Brain-compatible teaching, method "Break", Realistic teaching (RME), Guided active learning, Jigsaw method, problem solving, rpg, simulation.

Recommended literature:

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 28

A	B	C	D	E	FX
96,43	0,0	0,0	3,57	0,0	0,0

Lecturers: RNDr. Monika Dillingerová, PhD.

Last change: 17.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 7.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 8.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-121/22	Pedagogic Diagnostics

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

Number of credits: 2

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI-Prif.KDPP/2-UXX-121/15

Course requirements:
The condition for successful completion of the course is to obtain at least 60% of the maximum possible evaluation of the course = active participation in classes (30%), homework (20%), reading literature (20%)
The course is completed by an exam (30%).
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): 70/30

Learning outcomes:
Students will acquire key knowledge about the standard form of diagnostics, its basic stages and the formulation of diagnostic conclusions. They will acquire the necessary competencies in the use of diagnostic procedures and techniques for determining and evaluating students' performance in school conditions and in the reflection and evaluation of their own activities and professional growth.

Class syllabus:
Diagnosis as standard, resp. intuitive process of detailed cognition and evaluation of the pupil's personality, pupil groups, resp. family environment. Diagnosis as a "court" about a student (student groups), various types of diagnoses, including case studies. Diagnostic procedures and techniques (product analysis of pupils 'activities, performance tests, design techniques and traditional testing methods. The essence of school evaluation and its types. Evaluation of pupils' results, effects and school conditions. Action research as a specific professional activity of a teacher. Observation method. Interview method. Sociometers, self-diagnostics of pupils and teachers (self-evaluation,

burnout diagnostics, diaries, questionnaires ...), diagnostics of classroom relationships, diagnosis of bullying.

Recommended literature:

FONTANA, D. 2014. Psychology in school practice. Prague: Portal 2014. 384 p. ISBN 978-80-262-0741-2
GAVORA, P. 2010. What are my students like? Nitra: Enigma, 2010. 224 p. ISBN 978-80-89132-91-1
JEDLIČKA, R. 2018. Pedagogical - psychological diagnostics (Chapter 7). In JEDLIČKA, R. et al. Educational psychology for teachers. Prague: Grada, 2018. p. 349-358. ISBN 978-80-271-0586-1
DYTRTOVÁ, R. - KRHUTOVÁ, M. 2009. Teacher: příprava na profesi. Publisher information: Praha: Grada, 128 s. ISBN 978-80-247-2863-6
HRABAL, V. st. - HRABAL, V. Jr. 2004. Diagnostics: Pedagogical-psychological diagnostics of a pupil with an introduction to diagnostic application. Prague: Karolinum. 268 s. ISBN 80-246-0319-3
HELUS, Z. 2007. Social psychology for pedagogues. Prague: Grada, 2007. 280 p. ISBN 978-80-247-1168-3
KOMPOLT, P. - TIMKOVÁ, B .: Pedagogical diagnostics and action research. Bratislava: UK, 2010. ISBN 978-80-223-2787-9
MIKULAJOVÁ, M. et al. 2012. Reading, writing and dyslexia. Bratislava: Slovak Association of Speech Therapy. 296 s. ISBN 978-80-89113-94-1
POKORNÁ, V. 2010. Theory and correction of learning and behavioral disorders. Prague: Portal. 336 s. ISBN 978-80-7376-817-3
MERTIN, V., KREJČOVÁ, L .: Methods and Procedures of Pupil Cognition. Pedagogical diagnostics. Wolters Kluwer CR, 2016;
GINNIS, P .: Effective Teaching Tools for Teachers. Universum Publishing House, 2019;
FLETCHER-WOOD, H .: Responsive Teaching. Cognitive sciences and formative assessment in practice. Universum, 2021.

Languages necessary to complete the course:
Slovak, Czech

Notes:

Past grade distribution
Total number of evaluated students: 96

A	B	C	D	E	FX
62,5	11,46	9,38	5,21	9,38	2,08

Lecturers: Mgr. Lucia Budinská, PhD., PaedDr. Mgr. Natália Kováčová, PhD., doc. Mgr. Karolína Miková, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-201/22	Philosophical Aspects of Education

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

Number of credits: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
During the teaching period of the semester: participation, activity, elaboration of assignments or final test. The test or assignments will be from the material covered during the semester. The student can get a maximum of 50 points, the minimum for successful completion of the course is 30 points.
Classification scale: A: 100-92%, B: 91-84%; C: 83-76%, D: 75-68%, E: 67-60% FX: 0-59%
Violation of academic ethics results in the cancellation of the obtained points in the relevant evaluation item. The teacher accepts max. 2 absences with proven documents.
Interim / final evaluation weight: 100% in the examination period

Learning outcomes:
Upon successful completion of the course, students will know:
A: in the field of knowledge:
• What is philosophy, its basic structure, goals and mission
• What issues do philosophy of education and philosophical anthropology address, what are their goals and mission?
• What is the significance of philosophy for solving problems of theory and practice of education
B: in the field of skills:
• Orientation in basic philosophical problems, disciplines and concepts
• Ask questions and formulate answers regarding philosophical questions of education
• Think independently about philosophical issues of education

Class syllabus:
1. The concept and structure of philosophy
2. Philosophical and pedagogical anthropology
3. Philosophical anthropology and axiology
4. Philosophy of education I.
5. Philosophy of education II.
6. Philosophy of culture and values
7. Ethical issues and perspectives of education

Recommended literature:

ANZENBACHER, Arno: Introduction to Philosophy. Prague: SPN, 1991. ISBN: 80-04-26038-1.
BREZINKA, Wolfgang: Filozofické základy výchovy. Prague: Zvon, 1996. ISBN: 80-7113-169-5
CORETH, Emerich: What is a human being? Fundamentals of philosophical anthropology. Prague: Zvon, 1994. ISBN: 80-7113-098-2
POPKIN, Richard. H., STROLL, Avrum: Philosophy for Everyone. Prague: Ivo Zelezny, 2000. ISBN: 80-240-0257-4
PELCOVÁ, Naděžda: Philosophical and pedagogical anthropology. Prague: Karolinum, 2000. ISBN: 80-246-0076-5
Complementary literature and literature that is not in AK UK will be presented at the beginning and during the semester. Teachers' presentations and non-AK UK literature are available at MS Teams.

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 58

A	B	C	D	E	FX
70,69	18,97	8,62	0,0	1,72	0,0

Lecturers: Mgr. Štefan Zolcer, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-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: 2

Recommended semester: 1., 7.

Educational level: I.II., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
Practicing of the students´ game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2007

A	B	C	D	E	FX
97,41	0,6	0,1	0,0	0,0	1,89

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-120/00	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: 2

Recommended semester: 2., 8.

Educational level: I.II., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of areobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1797

A	B	C	D	E	FX
98,44	0,33	0,06	0,06	0,06	1,06

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

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-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., 9.

Educational level: I.II., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1525

A	B	C	D	E	FX
98,36	0,39	0,07	0,0	0,07	1,11

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-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., 10.

Educational level: I.II., II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1267

A	B	C	D	E	FX
98,34	0,39	0,08	0,08	0,08	1,03

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

Last change: 15.03.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-235/22	Physics Around Us

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: II.

Prerequisites:

Antirequisites: FMFI.KDMFI/1-UFY-335/15

Course requirements:
Continuous assessment: Active participation and communication of students in solving assigned tasks and discussion is expected. During the semester, each student will present a separate paper on the topic chosen by him. In addition, he prepares his own photo or video of a physical phenomenon from everyday life. Outputs are evaluated. The correctness of physics and the didactic quality of the output is evaluated.
Indicative evaluation scale, the following mark must be achieved at least: A 90%, B 80%, C 70%, D 60%, E 50%. Credits will not be awarded if the student scores less than 50%.

Learning outcomes:
Graduates will have developed skills to apply the knowledge gained in physics, didactics and pedagogy to formulate and solve physical problems from home, leisure activities and similar areas of everyday life.

Class syllabus:
The seminar is designed as a collection of relatively separate case studies analyzing situations or objects from everyday life, analyzing the physical laws operating in given situations with an emphasis not only on qualitative but especially quantitative characterization of relevant phenomena. The emphasis is on order estimates and calculations. Some typical case studies: Scaling - volume and content ratios, physics around a washing machine, physics of energy transport, vehicle cornering, music and physics, computational physics, planets and stars.

Recommended literature:

Languages necessary to complete the course:
Slovak and 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: PaedDr. Peter Horváth, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-238/22	Physics Aspects of Living Systems

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: II.

Prerequisites:

Course requirements:
Students will write a written semester work during the semester. Project of the work (10 marks), preliminary work (20 marks), final version (20 marks), defence (20 marks), peer-assessment of the work of colleagues (30 marks).
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:
After completing the course, the student will be able to use physics knowledge in the context of living systems. Will understand the selected physics properties of cells, biological tissues, organs and organisms.

Class syllabus:
Physics properties of the cell membrane and transport processes. Physics basis of sensory perception, receptors. Physical principles of respiration. Physical principles applied in blood circulation. Electrical properties of tissues and organs. Own and mediated physical signals of tissues and organs, their recording. Interaction of ionizing radiation with matter. Imaging methods.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 35

A	B	C	D	E	FX
45,71	34,29	14,29	5,71	0,0	0,0

Lecturers: doc. PaedDr. Viera Haverlíková, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-262/22	Programming Competitions

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in class (25%), homework (75%)
Students know how to search for basic information about the competition, find out for whom it is intended, rules, course, get acquainted with the types of tasks that are typical for the competition.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
Students will have an overview of computer competitions for primary and secondary school, respectively. with competitions that have no restrictions on participants. They will know the characteristics of these competitions in order to be able to guide the students in which to participate. They will know the difficulty level of the tasks in each competition. They will know about possible sources of ideas for interesting examples in the competition archives.

Class syllabus:
233 / 5 000
Výsledky prekladov
• Overview of IT competitions with a focus on programming, resp. Troubleshooting.
• Get acquainted with their rules, organization, target group and other specifics.
• Demonstrations of problems from these competitions and their solutions.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 34

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

Lecturers: RNDr. Michal Winczer, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., Mgr. Lucia Budinská, PhD.

Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-236/15	Programming of Application for WEB (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: 1.

Educational level: II.

Prerequisites:

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

Learning outcomes:
The student will be able to create a more complex educational web application using databases, or other repositories and modern technologies for the development of dynamic web applications.

Class syllabus:
- HTML5 - Canvas, Web Storage, Media, Drag&Drop
- AJAX - manipulation of objects with their properties (also CSS), effects, event handling, efficient work with forms, etc.
- Two-way communication between server and client
- JQuery, JQueryUI, Vue.js, or other suitable framework

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

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 24

A	B	C	D	E	FX
37,5	12,5	8,33	16,67	20,83	4,17

Lecturers: PaedDr. Roman Hrušecký, PhD.

Last change: 21.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-237/22	Robotics in 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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Interim evaluation: creation of activities during seminars (50%) and methodological materials and parallel testing of these activities for selected robotic toys (50%)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be at the end of the semester:
- Able to work with one or two robotic toys
- Know and apply the criteria for creating methodological materials for working with robotic toys and kits
- They will have experience in verifying proposed activities
- They will be able to look at teaching robotics from the perspective of taxonomies
- They will know the risks and benefits of educational robotics and its impact on the development of students' skills

Class syllabus:
• Work with a selected robotic kit
• Didactic analysis of the curriculum in educational robotics
• Taxonomy in the context of robotic toy programming
• Preparation and analysis of methodological materials for robotic kits
• Verification of proposed materials

Recommended literature:
• The teacher's own electronic study materials published on the subject's website, resp. in Moodle
• Ďalšie vzdelávanie učiteľov základných škôl a stredných škôl v predmete informatika : Didaktika robotických stavebníc : 1.2 Vzdelávanie nekvalifikovaných učiteľov informatiky na 2. stupni ZŠ a na SŠ / Martina Kabátová, ... [et al.]. Bratislava : Štátny pedagogický ústav, 2010
Premeny školy v digitálnom veku / Ivan Kalaš a kolektív. Bratislava : Slovenské pedagogické nakladateľstvo - Mladé letá, 2013

• Various materials from manufacturers of selected robotic kits such as LEGO, Ozobot, Micro: bit, etc.

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
90,32	3,23	1,08	2,15	0,0	3,23

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

Last change: 21.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 7.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 8.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 9.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 10.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-241/22	School Biology 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: 3.

Educational level: II.

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. 20 points. During the exam period, there will be a discussion, where the student can get max. 30 points. Credits will not be awarded if a student scores less than 50%.
Indicative final mark: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
The student will have a deep knowledge of the boundaries between the subjects of physics, chemistry and biology, especially at the lower secondary school level.

Class syllabus:
Various approaches to science education in different education systems. The usual content of subjects science, biology, chemistry physics at the ISCED level 2. Empirical cognition and work with sources of information in science education at lower secondary school.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 3

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: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-205/22	Selected Chapters of The Learning Sciences

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: II.

Prerequisites:

Course requirements:
During the semester, the student, based on information from lectures, prepares a proposal for a semester work (10 points) in the required structure, defends it (10 points) and implements it (20 points).
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student knows selected approaches to current principles and tenets of learning formulated on knowledge of neuroscience results. In accordance with these principles and tenets can design a series of teaching sequences in his approbation.

Class syllabus:
Selected approaches to cognitive psychology. The theory of the 5 pillars of the mind. Knowledge-in-Pieces Theory. Principles and tenets of learning. Applying the acquired knowledge in design a series of teaching sequences in approbation subject.

Recommended literature:
5 pillars of Mind / T.Tokuhama-Espinosa
The Learning Science / R.K.Sawyer
Course materials

Languages necessary to complete the course:
Slovak in combination with English (study literature also in English).

Notes:

Past grade distribution
Total number of evaluated students: 13

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: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/2-UFY-102/22	Selected chapters from Modern Physics

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: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
During the semester, there will be two written examinations, from which the student can obtain max. 2x 20 marks. 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. In the exam period, there will be a structured discussion, where the student can get max. 30 marks. Credits will not be awarded if the student scores less than 50% of the marks.

Learning outcomes:
The graduate will have advanced knowledge in selected areas of modern physics with a focus on higher secondary and high school physics teachers.

Class syllabus:
Statistical physics, Thermodynamics, Perspectives of theoretical physics on light, electricity, electromagnetism, nuclear physics, quantum mechanics, particle physics and cosmology.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 76

A	B	C	D	E	FX
53,95	25,0	11,84	1,32	7,89	0,0

Lecturers: doc. Mgr. Samuel Kováčik, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 7.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 8.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 9.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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., 10.

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-115/17	Sports in Natur (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., 7.

Educational level: I.II., 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. 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: 186

A	B	C	D	E	FX
98,92	0,0	0,0	0,0	0,0	1,08

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-116/18	Sports in Natur (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., 8.

Educational level: I.II., 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: 109

A	B	C	D	E	FX
95,41	0,0	0,0	0,0	0,0	4,59

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. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-204/22	Starting Teacher at School

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: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in seminars + preparation for classes (80%), project / report (20%)
A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student:
- gets a concrete idea of the teacher's responsibilities
- will be acquainted with the recommended procedures and effective ways of solving various situations in pedagogical practice
- propose activities and be able to assess their suitability for application to different problems with different groups of students
- can plan their own personal development in addition to professional development and take a critical approach to self-reflection

Class syllabus:
- first year of the teacher (holidays, payslips, attendance, introductory teacher, training, ...)
- work of subject commissions and pedagogical documentation
- class
- coordination of school activities and events
- communication with parents
- crisis situations at school
- professional development and mental health care
- toxic stress and inappropriate behavior
- bullying at school, mobing and bossing
- working with students with special educational needs

Recommended literature:
own electronic texts published on the website, resp. in the Moodle environment
GINNIS, P .: Effective Teaching Tools for Teachers. Universum Publishing House, 2019.

GORDON, T .: School without Losers. Malvern. 2015.
BREAUX, A .: Quick help for teachers. Portal. 2020.
SMETÁČKOVÁ, I., ŠTECH, S .: Učitelské vyhoření. Portal. 2020.
ČAPEK, R .: Lazy Teacher. How to teach well and effectively. Raabe. 2019
BUCHWALD, P .: Stress at school and how to manage it. Edika. 2013.
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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 10

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

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

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-245/22	Symbols and Patterns in Physics 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: 4.

Educational level: II.

Prerequisites:

Course requirements:
During the semester there will be two tests from which the student can obtain max. 2x 10 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 defends the semester work - max. 20 points. Credits will not be awarded if the student scores less than 50% of marks.
Rating scale: over 90% A; 80% -90% B; 70% -80% C; 60% -70% D; 50% -60% E.

Learning outcomes:
Students are familiar with current approaches to symbols, patterns, order, categories, and relationships in the context of human thinking. They know how to identify them in different topics, contexts and approaches to physical and science education.

Class syllabus:
Symbols. Patterns. Order. Categories. Relationships.
Identification of ways of thinking in topics, contexts of physics and science education.

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

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. RNDr. Peter Demkanin, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UXX-203/22	Teacher Communication Skills

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: II.

Prerequisites:

Course requirements:
Continuous assessment: active work in class (interactive presentation and practical solution of tasks - 50% of continuous assessment), submission and presentation of assignments (preparation for class and completion of lessons - 50% of continuous assessment).
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100 / 0

Learning outcomes:
The student will be at the end of the semester:
- know specific activities focused on psychosocial interaction
- have experienced and practiced application of selected communication skills
- familiar with the rules and implications of best practices for effective communication
- know the rules and structure of arguments
- be able to appropriately apply the knowledge of solo taxonomy in evaluating the quality of verbal statements of the student

Class syllabus:
- Key competencies of the teacher, influential theories about concepts in communication
- Verbal and nonverbal communication in the classroom
- Evaluation of verbal outcomes - SOLO taxonomy
- Argumentation as a part of critical thinking, conceptual comics
- Teacher questions
- Feedback
- Pupils' participation in learning communication
- Dialogue teaching
- Use of psychosocial interaction training in school practice
- Silent video as a means of developing communication skills

Recommended literature:
šeďová, K. et al .: Výukova komunikace, Masarykova Univerzita, Brno 2019.

Svoboda, M .: Psychosocial interaction training in pedagogical practice, University of West Bohemia in Pilsen, 2017.

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 32

A	B	C	D	E	FX
62,5	9,38	6,25	9,38	9,38	3,13

Lecturers: doc. Mgr. Karolína Miková, PhD., doc. PaedDr. Klára Velmovská, PhD., Mgr. Mária Božová

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-851/22	Teaching Practice A (2)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 10d
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: 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: 47

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

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

Last change: 22.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-853/22	Teaching Practice A (3)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 15d
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: 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: 62

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: 22.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-854/22	Teaching Practice A (3)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 15d
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: 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: 72

A	ABS	B	C	D	E	FX
97,22	0,0	2,78	0,0	0,0	0,0	0,0

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

Last change: 22.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, 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/2-UXX-852/22	Teaching Practice B (2)

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 10d
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: 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: 60

A	ABS	B	C	D	E	FX
98,33	0,0	0,0	1,67	0,0	0,0	0,0

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

Last change: 22.08.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-244/22	The Learning Sciences and Physics Education at Higher Secondary Schools

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
During the semester, each student will lead a teaching unit in the role of a teacher with the use of aids prepared or borrowed on a chosen topic (70%). Discussions during presentation of peers is for 30%.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Credits will be awarded if the student obtains at least 50%.

Learning outcomes:
Students will know selected current approaches to the sciences of learning and will be able to apply these to high school physics. The focus will be on the use of research teaching methods. Students will have experience in leading teaching sequences in a peer environment.

Class syllabus:
The course is designed as a set of teaching units prepared and presented by students, on predetermined topics, models work in the classroom. The content is focused on the topics of high school physics, while the focus is adapted to the current interest of students. The outputs will reflect mainly from the didactic side with regard to the results of the learning sciences. From atmospheric pressure to absolute temperature zero, mechanics, electromagnetism, optics, atomic and nuclear 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. Peter Horváth, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UFY-243/22	The Learning Sciences and Physics Education at Lower Secondary Schools

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: 4.

Educational level: II.

Prerequisites:

Course requirements:
During the semester, each student will lead a teaching unit in the role of a teacher with the use of aids prepared or borrowed on a chosen topic (70%). Discussions during presentation of peers is for 30%. Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50% Credits will be awarded if the student obtains at least 50%.

Learning outcomes:
Students will know selected current approaches to learning sciences and will be able to apply these to physics and science education in primary school. The focus is mainly on the use of research teaching methods, the development of critical and creative thinking and the building of transferable competencies.
Students will have experience in leading teaching sequences in a peer environment.

Class syllabus:
The course is designed as a set of teaching units prepared and presented by students, on predetermined topics, models work in the classroom. The content is focused on the topics of physics and other science subjects of primary school, while the choice of contexts is adapted to the interests of students. The outputs will reflect mainly from the didactic side with regard to the results of the learning sciences.

Recommended literature:

Languages necessary to complete the course:
Slovak and 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: PaedDr. Tünde Kozánek Kiss, PhD.
Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-101/22	Theoretical Computer Science (1)

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

Number of credits: 2

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: yes, homework (25%)/ tests (25%)
Exam: written
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E% 50%)

Learning outcomes:
To introduce the issue of theoretical informatics, to acquaint students with classical and current areas of research, in which there are basic questions: Can all problems be solved algorithmically? How effective is the solution? What are the solution techniques? After completing the course, students will know what a computational model is. On the computational model, the finite state machine (KA) will know what the calculation step is, the calculation, the accepting calculation. They will be able to show (prove) that a specific problem (language recognition) is solvable or. unsolvable at KA. Students will understand the definition of nondeterminism and its use in solving simple problems. Students will be able to write simple programs for the Turing machine.

Class syllabus:
Brief introduction to the main concepts of theoretical computer science:
• Alphabets, Words, Languages and Algorithmic Problems
• computational model Finite automaton (KA),
• Configuration, calculation step, calculation, accepting and non-accepting calculation.
• Method of KA design: ad hoc and the need for proof of correctness resp. modular design
• Existence of problems that are unsolvable at KA. Evidence of non-existence
• Nondeterministic finite state machine (NKA), Configuration, calculation step, calculation, accepting and non-accepting calculation.
• Equivalence of KA and NKA (subsoil construction)
• Introduction to the computational model of the Turing machine

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 49

A	B	C	D	E	FX
81,63	12,24	4,08	2,04	0,0	0,0

Lecturers: RNDr. Michal Winczer, PhD., Mgr. Lucia Budinská, PhD., prof. RNDr. Zuzana Kubincová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-UIN-102/22	Theoretical Computer Science (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: II.

Prerequisites: FMFI.KI/1-INF-215/14 - Formal Languages and Automata (1) or FMFI.KAI +KDMFI/1-AIN-211/22 - Introduction to Theoretical Informatics or FMFI.KDMFI/2-UIN-101/22 - Theoretical Computer Science (1)

Course requirements:
Continuous assessment: homework (25%)/ tests (25%)
Exam: written
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E% 50%

Learning outcomes:
Students will deepen and expand their knowledge in the field of theoretical informatics, they will get acquainted with other current areas of research, they will further explore the basic questions of theoretical informatics: How effective is the solution? What are the solution techniques? Students will know the computational model of TS, they will be able to simulate several modifications of TS (multiband, nondeterministic). They will know that there are problems that cannot be solved on TS. They will be able to use the reduction between problems to prove both solvability and unsolvability.

Class syllabus:
• Turing machines
• Computability
• Complexity theory
• Ways to solve difficult problems
• Cryptography

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 26

A	B	C	D	E	FX
92,31	3,85	0,0	3,85	0,0	0,0

Lecturers: RNDr. Michal Winczer, PhD., Mgr. Lucia Budinská, PhD., prof. RNDr. Zuzana Kubincová, PhD.
Last change: 22.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/2-UFY-101/22	Theoretical 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: 4

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
During the semester the students chooses a project and presents it to the group (topic is related to those presented in lectures) – this is 60% of the final grade. The final exam has both a written and an oral part of the exam, together making up 40% of the final grade.

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:
Slovak and English

Notes:

Past grade distribution
Total number of evaluated students: 88

A	B	C	D	E	FX
50,0	17,05	12,5	12,5	6,82	1,14

Lecturers: doc. Mgr. Samuel Kováčik, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/2-UFY-236/22	Theory of Relativity

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

Number of credits: 2

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: tests (4x10 marks), teaching-learning sequences (2x10 marks)
Exam: written (40 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:
Graduates will have a basic understanding of the theory of relativity by understanding selected materials for advanced high school physical education and selected popular science articles in the field.

Class syllabus:

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 0

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

Lecturers: RNDr. Eduard Masár, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI+KAI/2-UIN-247/15	Web Technologies in Teaching

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: 3.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: active participation in class (15%), homework (25%), papers (25%), project (35%)
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 familiar with different tools based on the latest web technologies, will be able to decide which of these tools are suitable for which learning activities and will be able to suggest different ways of using them in school practice.

Class syllabus:
- new interactive web tools - overview, technological and pedagogical background, relation to learning theories
- blog, vlog, microblog
- collaborative editors and other tools, wikis
- podcasting, social bookmarking and tagging
- social networks
- tools for evaluating activities on the interactive web, peer-review, peer-assessment, self-assessment

Recommended literature:
• The teacher's own electronic study materials published on the course website or in the Moodle system
• Selection of recent publications in the field

Languages necessary to complete the course:
SLovak, English

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
90,0	0,0	10,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Zuzana Kubincová, PhD.

Last change: 22.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD., doc. PaedDr. Monika Tomcsányiová, PhD., prof. RNDr. Zuzana Kubincová, PhD.