Course descriptions

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COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.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.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/2-pUFY-961/19	**Course title:** Didactics of Physics
Number of credits: 0	
Educational level: N	
State exam syllabus:	
Last change: 29.11.2019	
Approved by: doc. RNDr. Peter Demkanin, PhD.	

COURSE DESCRIPTION

Academic year: 2025/2026

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: 3.

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: 89

A	B	C	D	E	FX
61,8	28,09	8,99	0,0	0,0	1,12

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

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 4.

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.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-pUFY-901/19	Diploma Thesis Project

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: 0

Recommended semester: 4.

Educational level: N

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 7

A	B	C	D	E	FX
85,71	0,0	0,0	0,0	0,0	14,29

Lecturers: doc. RNDr. Peter Demkanin, PhD., RNDr. Monika Dillingerová, PhD.

Last change:

Approved by: doc. RNDr. Peter Demkanin, PhD.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 5

Recommended semester: 3.

Educational level: I., N

Prerequisites: FMFI.KDMFI/1-UFY-232/22 - School Physics (1) or FMFI.KDMFI+KEF/1-UFY-132/15 - School Physics (1)

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

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

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

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 74

A	B	C	D	E	FX
63,51	14,86	12,16	5,41	2,7	1,35

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022
Approved by: doc. RNDr. Peter Demkanin, PhD.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 4.

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.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 3

Recommended semester: 3.

Educational level: I., N

Prerequisites:

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

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

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

Recommended literature:

Languages necessary to complete the course:
Slovak and English.

Notes:

Past grade distribution
Total number of evaluated students: 82

A	B	C	D	E	FX
52,44	24,39	18,29	2,44	1,22	1,22

Lecturers: doc. PaedDr. Klára Velmovská, PhD.

Last change: 18.06.2022

Approved by: doc. RNDr. Peter Demkanin, PhD.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KDMFI/2-pUFYx-211/19	Teaching Practice

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 20s
Form of the course: on-site learning, combined

Number of credits: 0

Recommended semester: 3.

Educational level: N

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 12

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

Lecturers: PaedDr. Peter Horváth, PhD.

Last change: 16.06.2023

Approved by: doc. RNDr. Peter Demkanin, PhD.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/2-pUFY-911/19	**Course title:** Thesis Defence
Number of credits: 0	
Educational level: N	
State exam syllabus:	
Last change: 16.06.2023	
Approved by: doc. RNDr. Peter Demkanin, PhD.	