# Course descriptions

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**STATE EXAM DESCRIPTION**

| | |
|---|---|
| **Academic year:** 2026/2027 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |
| **Course ID:**<br>FMFI.KDMFI/2-pUIN-913/19 | **Course title:**<br>Didactics of Informatics |
| **Number of credits:** 0 | |
| **Educational level:** N | |
| **State exam syllabus:** | |
| **Last change:** 03.12.2019 | |
| **Approved by:** 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:** 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:** 3.

**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:** 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:** 4.

**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:** 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-pUIN-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: 16

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 87,5 | 0,0 | 0,0 | 0,0 | 12,5 | 0,0 |

**Lecturers:** doc. PaedDr. Monika Tomcsányiová, PhD., RNDr. Monika Dillingerová, PhD.

**Last change:**

**Approved by:** 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-pUIN-002/15 | Programming Languages in Education |

**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:** 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: 29

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65,52 | 17,24 | 10,34 | 0,0 | 3,45 | 3,45 |

**Lecturers:** doc. PaedDr. Monika Tomcsányiová, PhD., Mgr. Lucia Budinská, PhD.

**Last change:** 20.06.2022

**Approved by:** 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/1-UIN-250/00 | Propedeutics of Informatics Education (1) |

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

**Number of credits:** 2

**Recommended semester:** 3.

**Educational level:** I., II., N

**Prerequisites:**

**Course requirements:**
active participation in seminars and at least 50% of the semester
Continuous assessment: active participation in seminars (50%) and homework (30%)
Final test (20%)
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 80/20

**Learning outcomes:**
The student:
- knows the content and scope of the subject of informatics determined by the State Educational Program for various types and levels of schools
- will be able to design and evaluate curricula for the subject Informatics
- is able to identify the basic steps in creating the educational content of the lesson
- can interpret and evaluate available methodological materials
- acquires basic pedagogical habits

**Class syllabus:**
- Computer science teacher
- Informatics in other countries
- Curriculum analysis using Brunner's concept
- Phases of teaching in computer science teaching
- Educational goals of the subject of informatics at the 2nd level of elementary school and high school
- Educational goals of individual topics of informatics
- School curricula and curricula
- Project teaching
- Work with methodical materials
- Planning and implementation of evaluation in the subject of informatics

**Recommended literature:**
own electronic texts published

From educational program to teaching lesson / Marvin Pasch ... [et al.]; translated by Milan Koldinský. Prague: Portal, 2005
Školní didaktika / Zdeněk Kalhous, Otto Obst ... [et al.]. Prague: Portal, 2002
Transformations of the school in the digital age / Ivan Kalaš and team. Bratislava: Slovenské pedagogické nakladateľstvo - Mladé letá, 2013

**Languages necessary to complete the course:**
Slovak

**Notes:**

**Past grade distribution**
Total number of evaluated students: 225

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 73,33 | 8,44 | 8,44 | 3,11 | 0,89 | 5,78 |

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

**Last change:** 21.06.2022

**Approved by:** 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/1-UIN-251/00 | Propedeutics of Informatics Education (2) |

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

**Number of credits:** 2

**Recommended semester:** 4.

**Educational level:** I., II., N

**Prerequisites:** FMFI.KDMFI/1-UIN-250/00 - Propedeutics of Informatics Education (1)

**Course requirements:**
Interim evaluation: active participation in seminars (presentation of preparation (50%) and feedback (50%))
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 have experience in using theoretical knowledge in creating preparations for the lesson.
He will be able to critically evaluate the design and implementation of the lesson and express his opinion in the discussion.
The student will have built some basic pedagogical habits.

**Class syllabus:**
Course contents:
Students will create preparations for computer science lessons for the following topics:
Anti-virus and anti-spyware programs
Internet security and risks
Working with tables
Working with presentations
Working with graphics
Working with sound
Working with text
Working with a website
Encryption
Coding
Working with multimedia
Communication tools
Web search
In the form of a simulation, the lessons will test the preparations made and then discuss them.

**Recommended literature:**

From educational program to teaching lesson / Marvin Pasch ... [et al.]; translated by Milan Koldinský. Prague: Portal, 2005

Informatics for secondary schools: učebnica / Ivan Kalaš ... [et al.]. Bratislava: Slovenské pedagogické nakladateľstvo, 2005

Transformations of the school in the digital age / Ivan Kalaš and team. Bratislava: Slovenské pedagogické nakladateľstvo - Mladé letá, 2013

Work with graphics: thematic notebook for the 1st year of grammar schools, for the fifth of eight-year grammar schools / Ľubomír Salanci. Bratislava: Slovenské pedagogické nakladateľstvo, 2000

own electronic texts published on the website, resp. in the Moodle environment

**Languages necessary to complete the course:**

Slovak

**Notes:**

**Past grade distribution**

Total number of evaluated students: 177

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 74,01 | 6,78 | 8,47 | 2,26 | 2,82 | 5,65 |

**Lecturers:** Mgr. Jakub Krcho, PaedDr. Mgr. Natália Kováčová, PhD., doc. Mgr. Karolína Miková, PhD.

**Last change:** 21.06.2022

**Approved by:** 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/1-UIN-673/22 | Software 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:** 4.

**Educational level:** I., II., N

**Prerequisites:**

**Course requirements:**
Continuous assessment: The student can get 40% points for a review of software for teaching computer science. He will get another 60% of points for the design, specification and implementation of his own educational software.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
The student is able to assess the suitability of specific educational software for teaching computer science at elementary schools, high schools, respectively. VŠ. He is able to classify educational software. Can give examples of software that is suitable for education for a specific age group of students. Review educational software. Can apply the findings to the design of educational software. Creates a software proposal for teaching computer science for elementary or high school students.

**Class syllabus:**
The importance of digital technologies in the cognitive process, in teaching and learning.
Definition and classification of software used in education.
Criteria for evaluating educational software from different perspectives.
Educational applications for teaching computer science to primary and secondary school students.
Information systems used for education.
Software for education and developmental stages of knowledge.
GUI design for software to be used in education.
Action research - students and teachers as co-authors of software design for education.
Principles of creating software for education.
Educational software for students with special needs.

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

**Languages necessary to complete the course:**
Slovak

**Notes:**

**Past grade distribution**
Total number of evaluated students: 6

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

**Lecturers:** doc. PaedDr. Monika Tomcsányiová, PhD.

**Last change:** 20.06.2022

**Approved by:** 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-pUINx-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: 16

| A | ABS | B | C | D | E | FX | NEABS |
|---|---|---|---|---|---|---|---|
| 18,75 | 75,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 6,25 |

**Lecturers:** RNDr. Michal Winczer, PhD., PaedDr. Mgr. Natália Kováčová, PhD.

**Last change:** 16.06.2023

**Approved by:** 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:**<br>FMFI.KDMFI/2-pUIN-914/19 | **Course title:**<br>Thesis Defence |
| **Number of credits:** 0 | |
| **Educational level:** N | |
| **State exam syllabus:** | |
| **Last change:** 16.06.2023 | |
| **Approved by:** prof. RNDr. Zuzana Kubincová, PhD. | |