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.KI/1-INF-220/00	Algorithms and Data Structures

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

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

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

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 839

A	B	C	D	E	FX
38,62	15,14	16,09	11,2	11,92	7,03

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

Last change: 23.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-BIN-921/22	BSc Seminar (1)

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

Number of credits: 1

Recommended semester: 5.

Educational level: I.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 31

A	B	C	D	E	FX
61,29	16,13	9,68	3,23	0,0	9,68

Lecturers: doc. Mgr. Bronislava Brejová, PhD., Mgr. Askar Gafurov, PhD.

Last change: 27.10.2023

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-BIN-922/22	BSc Seminar (2)

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

Number of credits: 1

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
During the semester: Active participation, presentations, homework.
During exam period: presentation, bachelor thesis submission.
Grades: A 90%, B 80%, C 70%, D 60%, E 50%. More information on the course website.
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be familiar with research methods and principles of technical writing in computer science and bioinformatics. Students will be able to present their results in both written and oral form. They will be familiar with required thesis form and style.

Class syllabus:
Research methods, experimental evaluation. Principles of technical writing (typical document structure, references, illustrations and tables, appendices, correct use of formalism, authorship and plagiarism). Oral presentation guidelines (structure of a presentation, recommended visual aids). Regular presentation of current progress on the thesis topic, group discussion.

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 23

A	B	C	D	E	FX
86,96	8,7	0,0	0,0	0,0	4,35

Lecturers: doc. Mgr. Bronislava Brejová, PhD., Mgr. Askar Gafurov, PhD., doc. Mgr. Tomáš Vinař, PhD.
Last change: 27.10.2023
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KI/1-BIN-990/22	**Course title:** BSc Thesis Defense
Number of credits: 10	
Educational level: I.	
Prerequisites: FMFI.KI/1-BIN-922/22 - BSc Seminar (2)	
Course requirements: Final state exam Scale of assessment (preliminary/final): 0/100	
Learning outcomes: By completing and defending bachelor theses, students will demonstrate their ability to work in the area of bioinformatics.	
Class syllabus: Defense of the bachelor thesis	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 11.03.2022	
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.	

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KAgCh/1-BIN-112/15	Basic Chemical Calculation and Nomenclature

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

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KAgCh/N-bBXX-019/22

Course requirements:
During the semester, the student passes three written tests. Grade A will be awarded for at least 90 points, B for at least 80 points, C for at least 70 points, D for at least 60 points and E for at least 50 points. Credits will not be awarded to a student who scores less than 50 points.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
By completing the course, students will master the system of chemical nomenclature of inorganic substances and basic chemical calculations with emphasis on solutions.

Class syllabus:
Nomenclature of inorganic compounds: binary, pseudobinary, acids, salts, hydrogens and crystallide hydrates. Nomenclature of additive and coordination compounds. Basic quantities used in chemical calculations: amount of substance, mass, volume, the number of particles. The relationship between the amount of substance and the volume of an ideal gas. Quantities expressing the composition of solutions. Calculations with mass fraction and amount concentration. Balance equations. Calculations with volume fraction and mass concentration. Conversions between different ways of defining composition of solutions. Solubility of substances and composition of saturated solutions. Stoichiometry of chemical compounds. Stoichiometry of chemical equations. Calculations according to chemical equations. PH calculations of aqueous solutions, strong acids and bases. Osmotic pressure.

Recommended literature:
V. Fajnor a kol.: Cvičenia z anorganickej chémie pre biológov. 2. vyd. Bratislava: Univerzita Komenského, 2003.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 55

A	B	C	D	E	FX
25,45	16,36	12,73	12,73	10,91	21,82

Lecturers: RNDr. Jana Chrappová, PhD.

Last change: 11.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KMB/1-BIN-311/15	Bioinformatics

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

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KMB/N-bBMO-009/15

Course requirements:
To complete the course, it is necessary to participate in tutorials and submit protocols from all exercises. The exam is in the form of a written test. At least 85% must be obtained for grade A, at least 75% for B, at least 70% for C, at least 65% for D and at least 60% for E.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Students will gain basic knowledge in two main areas - working with biological databases and basic analysis of molecular biological data. The student will gain basic knowledge of working with database systems, especially in the field of life sciences, get acquainted with the structure of records of basic biological databases and the types of data that can be obtained from them. In the second part of the course the student will acquire basic skills in the analysis of molecular biological data (mainly DNA, RNA and protein sequences) and get acquainted with theoretical and practical aspects of analysis of their primary, secondary and tertiary structure in silico, i.e. through computer technologies.

Class syllabus:
1. Introduction to Bioinformatics: definition - history - content - internet - relation to other scientific disciplines 2. Biological databases: biological data - other data used in biology - division of biological databases - principles of work with databases. 3. Primary databases: types of primary sequences - ENA / GenBank / DDBJ - UniProt - GO - data entry - use. 4. Secondary databases: protein motifs - PROSITE - PRINTS - Pfam - BLOCKS - INTERPRO. 5. Other biological databases and integrated database systems: PDB - KEGG - OMIM - REBASE - bibliographic data - MEDLINE - integrated database systems - SRS - Entrez. 6. Analysis of biological data: collection and analysis of biological data - sequencing projects - statistical analysis - computer technology used - Staden Package - EMBOSS. 7. Identification of protein coding regions: signals - motifs - coding regions - prokaryotes vs. eukaryotes. 8. Alignments of two sequences: pairwise alignment - dot plot - substitution matrices - local and global alignments - BLAST - FASTA - Needleman-Wunsch

- Smith-Waterman. 9. Multiple sequence alignments: multiple sequence alignment - dynamic programming - progressive methods - consensus sequence - ClustalW. 10. Identification of protein motifs: protein motifs of secondary databases - neural networks - ScanProsite - Pscan - HmmPfam. 11. Molecular phylogenetic analysis: bioinformatics and evolution - phylogenetic trees - distance methods - maximum likelihood methods - parsimony methods - PHYLIP. 12. Secondary and tertiary structure of biomacromolecules: primary, secondary and tertiary structure - relationship between structure and function - 3D visualization - RasMol - MOLMOL.

Recommended literature:

Attwood, T.K., Parry-Smith, D.J., Phukan, S. Introduction to bioinformatics. Pearson Education, South Asia; 2007.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 12

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

Lecturers: Mgr. Ľuboš Kľučár, PhD., prof. RNDr. Hana Drahovská, PhD.

Last change: 11.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

STATE EXAM DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KI/1-BIN-950/15	**Course title:** Bioinformatics
Number of credits: 4	
Educational level: I.	
Course requirements: Final state exam Scale of assessment (preliminary/final): 0/100	
Learning outcomes: Final state exam before graduation in the bachelor study program Bioinformatics	
Class syllabus: Fundamentals of discrete mathematics, calculus, algebra, probability and statistics. Programming, data processing and visualization, database systems. Design and analysis of algorithms and data structures. Formal languages and automata. Methods in bioinformatics. Fundamentals of cell biology and genetics. Methods of molecular biology.	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 17.09.2025	
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.	

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 3

Recommended semester: 1., 3., 5.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 263					
A	B	C	D	E	FX
49,43	14,83	12,55	11,03	4,18	7,98
Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.					
Last change: 04.07.2022					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-DAV-102/20	Calculus (1)

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

Number of credits: 7

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment:
i) short control tests (5-10 short test during discussion sessions) - together approx. 30% of total course points,
ii) midterm exam - approx. 30% of total course points
At least 30% of the points from the maximum of the continuous assessment are required to be admitted to the final exam.
Final examination: together approx. 40% of total course points, consists of written test and oral exam with equal weights
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
In this course, students review their basic arithmetic skills and graphical representation of common functions. After completing it, students will be able to individually use the basic tools of mathematical analysis (elementary functions, complex numbers, derivatives and integrals) and gain knowledge about their applications and interpretation in real life.

Class syllabus:
Review of artimetics, algebraic operations, basic functions, trigonometry. Functions. Trigonometric, exponential, logarithmic and hyperbolic functions. Rational functions and limits. Complex numbers. Derivatives and their application. Series. Power series. Taylor expansion and approximation of functions. Plane curves and their fitting. Definite and indefinite integral and their applications.

Recommended literature:
K.A. Stroud, D.J Booth, Engineering Mathematics, Industrial Press Inc. New York, 7th Edition

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 281					
A	B	C	D	E	FX
18,51	14,59	18,15	16,73	14,23	17,79
Lecturers: doc. Mgr. Richard Kollár, PhD., Mgr. Jakub Poljovka					
Last change: 24.06.2022					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-DAV-112/20	Calculus (2)

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

Number of credits: 7

Recommended semester: 2.

Educational level: I.

Prerequisites: FMFI.KAMŠ/1-DAV-102/20 - Calculus (1)

Recommended prerequisites:
1-DAV-111 Supplementary Discussion Session in Mathematics

Course requirements:
Continuous assessment: midterm exam - 50% of total course points
Final examination: 50% of total course points, written exam and oral exam with equal weights
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Upon completion of the course, students will be able to individually use the basic tools of advanced mathematical analysis (partial derivatives, integrals of several variables, special functions, vector differential calculus, ordinary differential equations and dynamical systems, Laplace transform and Fourier series) and they will gain knowledge about applications and interpretation of these tools in real life.

Class syllabus:
Partial derivatives. Integrals of several variables. Special functions. Vector differential calculus. Functional series. First and second order ordinary differential equations. Laplace transformation. Fourier series.

Recommended literature:
K.A. Stroud, D.J Booth, Engineering Mathematics, Industrial Press Inc. New York, 7th Edition
K.A. Stroud, D.J Booth, Advanced Engineering Mathematics, Palgrave MacMillan, New York, 5th Edition
S. Strogatz, Nonlinear Dynamics and Chaos, Westview 1994

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 157					
A	B	C	D	E	FX
15,92	13,38	10,19	16,56	25,48	18,47
Lecturers: doc. Mgr. Richard Kollár, PhD.					
Last change: 24.06.2022					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KFR/1-BIN-114/22	Cell Biology

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: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 44

A	B	C	D	E	FX
18,18	18,18	20,45	11,36	11,36	20,45

Lecturers: doc. Mgr. Michal Martinka, PhD., prof. RNDr. Helena Bujdáková, CSc., prof. Mgr. Iveta Herichová, DrSc., doc. RNDr. Martin Mrva, PhD., doc. Mgr. Ľuboš Molčan, PhD., doc. Mgr. Renáta Švubová, PhD., doc. Mgr. Boris Bokor, PhD., doc. Mgr. Viktor Demko, PhD., RNDr. Jana Kohanová, PhD., doc. RNDr. Zuzana Lukačová, PhD.

Last change: 25.07.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1., 3., 5.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 106

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

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 5.

Educational level: I.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 292

A	B	C	D	E	FX
33,9	10,96	14,04	12,33	16,78	11,99

Lecturers: doc. RNDr. Dana Pardubská, CSc.

Last change: 21.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 1074

A	B	C	D	E	FX
12,2	9,5	13,5	12,85	22,72	29,24

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

Last change: 22.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/1-DAV-202/20	Data Management

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

Number of credits: 5

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI.KI+KAI/2-INF-185/15

Course requirements:
During semester: homework (45%), project proposal (5%).
Durig exam period: project and oral exam (50%). Grades A: 90..100, B: 80...89, C: 70...79, D: 60...69, E: 50...59, FX: 0..49. More information on the course website.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be able to process large data sets with general and specialized tools. They will also be able to present the methods used and visualize the results.

Class syllabus:
Reproducibility of computational analyses. Processing text files with UNIX tools. Basics of the Perl language. Databases and SQL. System R. Use of Python to automate data downloads and to process text data. Shared cluster computing and cloud infrastructure. Highly parallel computing tools.

Recommended literature:
Building bioinformatics solutions : with Perl, R, and MySQL / Conrad Bessant, Ian Shadforth, Darren Oakley. Oxford : Oxford University Press, 2009
The Data Science Design Manual / Steven S. Skiena. Springer 2017

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 227

A	B	C	D	E	FX
50,22	22,47	10,57	5,73	4,85	6,17

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Vladimír Boža, PhD.
Last change: 30.01.2026
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG+KI/1-DAV-105/20	Data Visualisation

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

Number of credits: 5

Recommended semester: 2.

Educational level: I.

Prerequisites: FMFI.KAI/1-DAV-202/20 - Data Management or FMFI.KAI+KDMFI/1-AIN-130/22 - Programming (1)

Recommended prerequisites:
Basic knowledge of the Python language

Course requirements:
Practical tasks (35%), group project (45%), quizzes (10%), oral exam (10%). More information on the course website.
Scale of assessment (preliminary/final): 90/10

Learning outcomes:
Students will get acquainted with the basics of data visualization. They will be able to interpret graphs, draw conclusions from them. They will be able to choose the appropriate chart type for given data and create the appropriate visualization using existing Python libraries.

Class syllabus:
Processing tabular data, data types (continuous, discrete, categorical), basic descriptive statistics (mean, median, quantiles, variance, correlation). Types of graphs for two-dimensional and multidimensional data (e.g. bar plot, pie chart, scatterplot, plotplot, histogram, parallel coordinates, contour lines, heatmaps). Dimensionality reduction methods. Display of special data types (time series, geographic data, networks and hierarchies, texts). Use of interactive elements. Human perception. Technical aspects (formats, tools). Choice of colors. Principles of data visualization, selection of a suitable type of graph, common errors in visualization. Interpretation of visualized data.

Recommended literature:
Information visualization : Perception for design / Colin Ware. Waltham : Morgan Kaufmann, 2013
Now you see it Simple visualization techniques for quantitative analysis / Stephen Few, Analytics Press, 2009
Cairo: The Truthful Art: Data, Charts, and Maps for Communication. New Riders; 1st edition, 2016.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 181

A	B	C	D	E	FX
61,33	20,99	9,94	2,21	0,0	5,52

Lecturers: doc. Mgr. Bronislava Brejová, PhD., Mgr. Martin Halaj, Ing. Branislav Zigo

Last change: 30.01.2026

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-DAV-301/24	Database Systems

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

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
During semester work on practicals, homeworks; final oral exam.
Grades: A 92%, B 84%, C 76%, D 68%, E 60%.

Learning outcomes:
Students will learn about common problems arising in usage and implementation of database systems and about techniques to deal with these problems. They will learn about the relational model from both theoretical and practical standpoint and get acquainted with principles of transactional systems. Students also learn basics skills in working with database systems and related technologies.

Class syllabus:
Relational model, relational query languages, SQL, theory of database design (functional dependencies, keys, normal forms). Writing and testing queries mostly in SQL. Transactions and their processing.
Creation of database interrelated database tables. Import and export of data, updates. Query optimization, indexes. Administration of database systems.

Recommended literature:
Foundations of databases / Serge Abiteboul, Richard Hull, Victor Vianu. Reading : Addison-Wesley, 1995
Database systems : The complete book / Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom. Upper Saddle River : Prentice-Hall, 2002
Postgres tutorial http://www.postgresqltutorial.com/

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 124					
A	B	C	D	E	FX
56,45	23,39	6,45	5,65	1,61	6,45
Lecturers: doc. RNDr. Ján Mazák, PhD.					
Last change: 16.09.2024					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 4.

Educational level: I.

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

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 722

A	B	C	D	E	FX
38,92	19,39	15,1	13,99	9,56	3,05

Lecturers: Mgr. Michal Anderle, PhD., prof. RNDr. Rastislav Kráľovič, PhD., Mgr. Jozef Rajník, PhD.
Last change: 23.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KI/1-DAV-101/20	Discrete Mathematics

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

Number of credits: 8

Recommended semester: 1.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: assessed homework, tests, written exams At least 50% of the points from the continuous assessment are required for admission to the examination. Exam: written, oral Exam weight: 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
This course will provide the mathematical foundations necessary for the study of computer science. Students will also learn mathematical culture, ways of thinking, reasoning and arguing in mathematics, as well as proof techniques. Specifically, the course will cover basic concepts, methods and algorithms from combinatorics, set theory, graph theory and logic.

Class syllabus:
Introduction to combinatorics and enumeration, basic combinatorial configurations, enumeration principles, basic combinatorial identities. Pascal's formula, binomial and polynomial theorem. Intuitive set theory and its paradoxes, basic set relations and operations on sets, cardinality of sets. Propositional logic, quantified propositions, basic methods of mathematical proofs. The principle of inclusion and exclusion and an introduction to discrete probability.
Relations and representations of relations (sets, graphs, matrices). Significant relations (equivalence, partial ordering). Graph theory, basic concepts and selected algorithms.

Recommended literature:
Discrete and combinatorial mathematics : An applied introduction / Ralph Grimaldi
Harlow : Pearson Education, 2014

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 270

A	B	C	D	E	FX
17,41	9,26	13,7	20,37	16,3	22,96

Lecturers: doc. RNDr. Edita Mačajová, PhD., doc. RNDr. Tatiana Jajcayová, PhD., Mgr. Jozef Rajník, PhD.

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 3., 5.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 318

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

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 4., 6.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 201

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

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 7538

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

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

Last change: 16.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1733

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

Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD., Mgr. Valéria Medárová, PhD.
Last change: 20.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1461

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

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

Last change: 16.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 4299

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

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

Last change: 16.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KBCh/1-BIN-303/22	Essential Cell Biology

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: 5.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KBCh/N-bCBI-020/16

Course requirements:
There will be regular written tests during the semester. Credits will not be awarded to a student who obtains less than 60% of the overall evaluation of the tests. The course will be completed by an oral exam. The evaluation will be given as follows: A - excellent results, B - above-average work, C - normal reliable work, D - acceptable results, E - results meeting the minimum criteria, Fx - insufficient results (knowledge of less than 60% of the course content).
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students will have an overview of the internal organization of prokaryotic and eukaryotic cells and the basic biological processes that take place in individual cell compartments. Emphasis is placed on the importance of biological membranes, intracellular compartmentalization and key molecular processes operating in cells.

Class syllabus:
Complex organization of eukaryotic cell. History and key discoveries of cell biology. Characteristic properties of eukaryotic cells. Comparison of ultrastructure of prokaryotic and eukaryotic cells. Importance of intracellular compartmentalization. The origin of the eukaryotic cell. The role of biological membranes in the eukaryotic cell. Membrane structure and function. Membrane transport. Vector processes bound to membranes. The role of membranes in nerve signal transmission. Cell nucleus. Ultrastructure and dynamics of the cell nucleus, nuclear membrane, nuclear pores, nucleolus. Chromosomes and chromosomal territories. Histones and histone-like proteins. Eukaryotic genome dynamics. Genome replication and repair. Transcription and principles of gene expression control. Levels of gene expression control in prokaryotic and eukaryotic cells. Transcriptional control and post-transcriptional RNA processing. Ribosome translation and function. Ribosome subunits. Ribosomal RNA and protein components of the ribosome. Basic steps in the regulation of proteosynthesis. Intracellular localization of proteosynthesis. Protein distribution in the cell. Posttranslational fate of proteins. Mitochondria

and chloroplasts. Ultrastructure and function of semiautonomous organelles. Specific roles of mitochondrial and chloroplast membranes. Organelle genomes. Oxidative phosphorylation. Photosynthesis-photophosphorylation. Endoplasmic reticulum, Golgi apparatus. Structure and function. Smooth and rough endoplasmic reticulum, sarcoplasmic reticulum. Vesicular transport. Role in protein distribution and transport in eukaryotic cells. Vacuoles, lysosomes and peroxisomes. Structure, function, biogenesis and distribution. Metabolism. Clinical significance of lysosomes and peroxisomes. Cytoskeleton as a dynamic structure. Cytoskeletal components. Cytoskeleton as a motive system: vesicular transport, cell motility and cell division. Cell surfaces. Cytoplasmic membrane and cell wall. Extracellular matrix. From individual cells to tissues and multicellular organisms. Cells in a social context. Biofilms. Cells as part of tissues. Epithelium and intercellular connections. Quorum sensing. Intercellular communication and cell death.

Recommended literature:

Alberts B., Johnson A., Lewis J., Raff M., Roberts K., Walter P. (2014) Molecular Biology of the Cell, Garland Science. Alberts B. a kol. (2014) Essential Cell Biology, 5th edition, W. W. Norton & Company. Lodish a kol. (2016) Molecular Cell Biology. 8th edition, W. H. Freeman and Company.

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution

Total number of evaluated students: 27

A	B	C	D	E	FX
37,04	14,81	14,81	18,52	14,81	0,0

Lecturers: prof. RNDr. Jozef Nosek, DrSc., doc. Mgr. Peter Polčic, PhD.

Last change: 13.09.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe+KZ +KBCh/1-BIN-302/22	Evolutionary Biology

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

Number of credits: 3

Recommended semester: 5.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KGe/N-bBUB-003/15

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 36

A	B	C	D	E	FX
11,11	22,22	27,78	11,11	22,22	5,56

Lecturers: doc. Mgr. Peter Vďačný, PhD., doc. Mgr. Peter Mikulíček, PhD., prof. RNDr. Ľubomír Tomáška, DrSc., RNDr. Regina Sepšiová, PhD., doc. RNDr. Marek Mentel, PhD., doc. RNDr. Ján Radvánszky, PhD.

Last change: 02.08.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-211/22	Evolutionary Developmental Biology

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

Number of credits: 3

Recommended semester: 6.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KEk/N-bBXX-031/15

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

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

Lecturers: doc. Mgr. Viktor Demko, PhD., doc. Mgr. Monika Okuliarová, PhD., doc. RNDr. Ján Radvánszky, PhD.

Last change: 01.08.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 3.

Educational level: I.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 789

A	B	C	D	E	FX
18,88	5,45	5,07	20,28	33,84	16,48

Lecturers: prof. RNDr. Branislav Rovan, PhD., doc. RNDr. Peter Kostolányi, PhD., Mgr. Andrej Ravinger
Last change: 08.02.2018
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1.

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

Prerequisites:

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

Learning outcomes:

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 499

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

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 2.

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

Prerequisites:

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

Learning outcomes:

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 307

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

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 3.

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

Prerequisites:

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

Learning outcomes:

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 128

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

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 4.

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

Prerequisites:

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

Learning outcomes:

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 79

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

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 5.

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

Prerequisites:

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

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 718

A	B	C	D	E	FX
19,64	11,7	14,35	21,45	22,7	10,17

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

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-113/15	General Biology

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

Number of credits: 3

Recommended semester: 4.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KGe/N-bCXX-008/15

Course requirements:
The course will be evaluated on the basis of the final test results from questions from topics covered during the semester. (max 25 points). Completion of the course is necessary to obtain a minimum of 50% of points. For certain types of activities in lectures (e.g. gaining the full number of points from voluntary tests during the semester) it will be possible to get bonus points for the final test. Rating scale: 61-67% = E; 68-75% = D; 76-84% = C; 85-93% = B; 94-100% = A. The course will take place on-site. In the case of a situation that does not allow the on-site form, the teacher decides on the method of online teaching.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The course will deal with the basic characteristics of life and the formulation of principles that apply to all living organisms. The possibilities provided by mathematics, computer science and chemistry for the study of biological phenomena will be identified. It is therefore suitable for students of biological, chemical, mathematics and computer science. The course is largely based on Theodosius Dobzhansky's thesis: "Nothing in biology that is not in the light of evolution makes sense." Students will be able to apply this principle when answering questions about the functioning of biological systems.

Class syllabus:
The general-biological principles will be presented through the following topics: (1) Basic concepts of modern biology; (2) Why are not living organisms immortal; (3) Stochastic processes in biology; (4) Robustness in biology; (5) Introduction to synthetic biology; (6) How do cells form coordinated communities?; (7) Parasite evolutionary strategies; (8) Importance and nature of regulations in biological systems; (9) Cooperative behavior and altruism.

Recommended literature:
Campbell, N.A., Reece, J.B. (2006). Biologie, (český preklad), Computer Press.
Darwin, Ch. (2016). O pôvode druhov. Citadella.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 42

A	B	C	D	E	FX
45,24	16,67	21,43	7,14	9,52	0,0

Lecturers: prof. RNDr. Ľubomír Tomáška, DrSc.

Last change: 14.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-BIN-315/22	Generic Subject in Bioinformatics (1)

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

Number of credits: 4

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
Course requirements are determined by the hosting university abroad and further instructions of the study program guarantor.

Learning outcomes:
Students will complete a course related to bioinformatics at a university abroad. This will allow them to acquire new skills in this area, establish new professional contacts and to improve their communication skills.

Class syllabus:
This course is intended for students who participate in a study exchange program at a university abroad, and complete at least one course related to bioinformatics during their exchange stay. In justified cases, it can be also completed by distance learning at a different university. The choice of the course has to be approved by the guarantor of the study program at the start of the semester.

Recommended literature:

Languages necessary to complete the course:
language of instruction of the host university

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. Mgr. Bronislava Brejová, PhD.

Last change: 11.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-BIN-316/22	Generic Subject in Bioinformatics (2)

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

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Course requirements are determined by the hosting university abroad and further instructions of the study program guarantor.

Learning outcomes:
Students will complete a course related to bioinformatics at a university abroad. This will allow them to acquire new skills in this area, establish new professional contacts and to improve their communication skills.

Class syllabus:
This course is intended for students who participate in a study exchange program at a university abroad, and complete at least one course related to bioinformatics during their exchange stay. In justified cases, it can be also completed by distance learning at a different university. The choice of the course has to be approved by the guarantor of the study program at the start of the semester.

Recommended literature:

Languages necessary to complete the course:
language of instruction at the host university

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. Mgr. Bronislava Brejová, PhD.

Last change: 26.01.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-201/22	Genetics (1)

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

Number of credits: 7

Recommended semester: 3.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KGe/N-bBXX-038/15

Course requirements:
Grades will be based on (1) preliminary examinations at practicals during the semester (20% of the final mark) and (2) the final test covering the entire syllabus (80%). The course has a standardized grading system which is identified below:
A (92 – 100%): Outstanding, excellent work (exceptional performance with strong evidence of original thinking and obvious capacity to analyze, synthesize and evaluate. B (85–91 %): Good, competent work; laudable performance with evidence of some original thinking, good problem-solving ability, exhibiting a serious, responsible engagement with the course content. C (77–84%): Adequate, reasonably satisfactory work; fair performance but infrequent evidence of original thinking or the capacity to analyze, satisfies the minimum requirements of the course. D (77–84%): Less acceptable work; relatively weak performance with little evidence of original thinking or ability to analyze or synthesize course material. E (60–68%): Minimally acceptable work; very weak performance with little evidence of original thinking, showing inadequate grasp of some basic elements of the course. Fx (under 60%): Inadequate work; poor performance that indicates a lack of understanding or misunderstanding of essential subject matter.
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Students will acquire a knowledge in classical genetics, cytogenetics, molecular basis of heredity, mechanisms involved in mutagenesis, population and quantitative genetics, genetic basis of cancer and development, extrachromosomal inheritance and contemporary whole genome analyses and their implications for evolutionary biology and medicine.

Class syllabus:
Lectures will cover the following areas of genetics: Genetics as a biological discipline - Chromosome basis of inheritance - Mendelian inheritance - Genetic determination of sex - Deviations from mendelian inheritance - Linkage of genes and genetic recombination - Chromosomal aberations and their evolutionary and clinical implications - DNA structure and mechanism of replication - Anatomy and function of a gene - Mutations as a source of genetic

variability - Gene expression I: Flow of genetic information from DNA to RNA - Gene expression II: Flow of genetic information from RNA to proteins - Gene expression III: Regulatory mechanisms in prokaryotes and eukaryotes - Methods in molecular genetics - Genetic analysis of prokaryotes - Population genetics - Inheritance of quantitative traits - Extrachromosomal inheritance - Genetic analysis of eukaryotic cell cycle and its implications for cancer - Genetic analysis of animal development - Comparative and evolutionary genomics.

Recommended literature:

Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics
Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M., Veres, R.C. (2008). Genetics: From Genes to Genomes. 3rd Edition. McGraw-Hill, International Edition.
Russell, P.J. (2006). iGenetics: A Molecular Approach. 2nd Edition. Pearson/Benjamin Cummings. International Edition.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 46

A	B	C	D	E	FX
10,87	8,7	15,22	32,61	26,09	6,52

Lecturers: prof. RNDr. Ľubomír Tomáška, DrSc., doc. RNDr. Eliška Gálová, PhD., Mgr. Lucia Mentelová, PhD., RNDr. Regina Sepšiová, PhD., doc. Mgr. Miroslava Slaninová, Dr., prof. RNDr. Andrea Ševčovičová, PhD., Mgr. Katarína Gaplovská, PhD., Mgr. Filip Brázdovič, PhD., doc. RNDr. Vladimíra Džugasová, PhD., Mgr. Katarína Procházková, PhD., Mgr. Stanislav Kyzek, PhD., Mgr. Ivana Kyzeková, PhD., Mgr. Filip Červenák, PhD., Mgr. Andrea Valentová, Mgr. Sára Pišteková, Mgr. Tomáš Petrík, Mgr. Zuzana Kubovčíková, Mgr. Peter Hergott, Mgr. Andrea Vetráková, Mgr. Rebeka Rusnáková, Mgr. Anna Oleksandrivna Martyrosian

Last change: 03.03.2026

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-312/15	Genetics (2): Model Organisms

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

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites: FMFI-PriF.KGe/1-BIN-201/22 - Genetics (1)

Antirequisites: PriF.KGe/N-bBGE-006/15

Course requirements:
The condition for passing the course is the completion of the practicals and written tests. The evaluation of the practicals, including the results tests and evaluation of protocols, will represent a maximum of 20% of the grade. The rest of the grade is based on the final written test, composed of questions from the topics listed in the brief course syllabus. To complete the course, it is necessary to obtain at least 60%. The evaluation will be given as follows: A: 100-92%, B: 91-84%, C: 83-76%, D: 75-68%, E: 67-60%. Credits will not be awarded to a student who earns less than 60%.
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Students will gain general knowledge and overview of model organisms and their use in basic and applied research in genetics and related fields. Lectures will focus on the main models from prokaryotic and eukaryotic microorganisms, through plants, animals, to cell cultures. In practicals, students will learn selected genetic and molecular genetic methods used in working with selected model organisms.

Class syllabus:
1. Bacteria
Bacillus subtilis, Escherichia coli and Caulobacter cresentus are internationally recognized model organisms whose physiology, biochemistry and genetics have been studied for several decades. These bacteria are used to understand the basic cellular processes at the molecular level. The lecture should clarify how these processes are regulated and answer questions such as: 1. How can bacteria find their center where they build a division septum? 2. Why do single-cell organisms have systems to activate their own death? 3. How and why can bacteria differentiate? 4. How do bacterial cells form and maintain a certain shape? State-of-the-art methodologies of molecular biology, biochemistry, structural biology and microscopy are currently used to investigate these mechanisms, and many of them have been developed to study these processes.
2. Yeast

Yeast properties - advantages and disadvantages in comparison with other model organisms. Explanation of the use on examples from experimental work. The importance of yeast as a model organism in the past and prospects for the future.
3. Riasa Chlamydomonas reinhardtii
Elements of C. reinhardtii as a model object - tetrad analysis as a basis of classical genetic analysis, specific cell cycle, first algae included in a genome project, known sequences of the nuclear, chloroplast and mitochondrial genome. Comparative phylogenome analysis - the last common ancestor of plants and animals. Model for the study of photosynthesis, identification of chloroplast and flagella genes, study of flagellum structure and assembly, cell wall biogenesis, gametogenesis, maiting, phototaxy. Creating a complex EST (expressed sequence tags) library.
4. Trypanosomatides
Trypanosomatides are a large group of parasitic protozoa, many of which are important pathogens in plants, animals and humans. They belong to one of the earliest separating eukaryotes. Long independent development is probably responsible for a large number of extraordinary metabolic pathways, which make trypanosomatids a very interesting model for studying the diversity of the living world.
5. Genetics of Drosophila melanogaster
Genetics of Drosophila melanogaster - life cycle, genome, balancer chromosomes, phenotypic markers. Mobile elements and their use in transgenesis and the creation of transgenic individuals, Drosophila genome project, characterization of selected developmental stages and organs as model systems for the study of various biological processes or diseases.
6. Silkworm (Bombyx mori)
Transgenic and molecular procedures in functional analysis of genes - identification of genes encoding bioactive substances and their receptors. Study of gene expression by qRT-PCR, in situ hybridization and immunohistochemistry. In vitro characterization of receptors by bioluminescence method in CHO cells. Use of baculovirus expression system (Bac-to-Bac) for targeted expression of markers, toxins and receptors in specific cells. Use of transgenic techniques with the piggyBac transposomal element and the Gal4 / UAS system for functional analysis of specific organs, cells and bioactive substances in vivo and in vitro. Use of the CRISPR / Cas9 system for targeted mutation and manipulation of receptor genes. Ca2 + imaging for monitoring the activity of neurons and endocrine cells in vitro.
7. House mouse (Mus musculus)
History of M. musculus as a model organism; wild, inbred, outbred and recombinant mouse strains, selected inbred strains and their properties, transgenic mice, mouse models of human diseases, genetically and genomically humanized mouse models, whole genome association studies.
8. Cell cultures and other in vitro systems
Definition, basic types and division of BK. Basics of working with BK (principles of sterile work, culture media, dissociation enzymes, cell counting, staining). Special types of BK (stem cells, hybridomas, 3D cultures, spheroids, organoids). Examples and applications in clinical and applied research and in practice.
9. Plants as a model organism
The importance of plants for the study of molecular genetic processes. Plant cell specifics. Arabidopsis thaliana as a model organism in plant genetics, relationships between nuclear and chloroplast DNA.
10. Plant and environment
Plant response to abiotic and biotic types of stress. Stress proteins - structure and function. Arabidopsis thaliana - regulation of gene expression in higher plants under stress conditions.
11. The most important cultivated plants as genetic models

Genetic determination of the most important properties of selected crops (wheat, barley, maize, beet, potato, oilseed rape, edible tomato, etc.), genetic peculiarities and interesting facts of these crops. Male sterility genes, plant fertility restoration genes. Molecular mechanisms of male sterility. Practical use of the phenomenon of male sterility.
12. Cultivated plants as a model of genotype incompatibility studies
Genetic mechanisms of inbreeding prevention. Gametophytic and sporophytic incompatibility, their genetic determination, molecular principles. Practical significance of the incompatibility phenomenon.

Recommended literature:
Russell, P.J. (2010) iGenetics. A molecular approach. 3rd. edition. Pearson Education Inc. USA
Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M., Veres, R.C. (2008). Genetics: From Genes to Genomes. 3rd Edition. McGraw-Hill, International Edition.
Snustad, D.P. (2009) Genetika, Masarykova Univerzita, , K-public, Česká republika
odborná literatúra podľa odporúčania jednotlivých vyučujúcich

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 3

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

Lecturers: doc. RNDr. Vladimíra Džugasová, PhD., doc. RNDr. Eliška Gálová, PhD., prof. RNDr. Anton Horváth, CSc., RNDr. Miroslava Matúšková, PhD., Mgr. Lucia Mentelová, PhD., Mgr. Svetlana Miklíková, PhD., doc. Mgr. Miroslava Slaninová, Dr., Mgr. Stanislav Kyzek, PhD., RNDr. Dušan Žitňan, DrSc., Mgr. Ivana Kyzeková, PhD.

Last change: 11.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-313/15	Genetics (3): Cytogenetics

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: 6.

Educational level: I.

Prerequisites: FMFI-PriF.KGe/1-BIN-201/22 - Genetics (1)

Antirequisites: PriF.KGe/N-bBGE-004/15

Course requirements:
Grades will be based on participation in laboratory practice, which are mandatory and final exam in the form of written test. For the completion of the laboratory practice is necessary to obtain at least 60% from final credit test. Overall rating from Laboratory practice constitutes 20% of the final grade.
Final exam is in form of written test. The course has a standardized grading system (overall rating from Laboratory practice and final exam):
Grade A (92 – 100%), B (85 – 91%), C (77 – 84%), D (69 – 76%), E (60– 68%)
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Completing the course the student acquires the knowledge about cell nucleus, mitosis and meiotic cell division, chromosome structure in different models, cell cycle and chromosome aberrations. Further, the latest methods in molecular cytogenetics will be also discussed.

Class syllabus:
Cell nucleus and its compartments, structure and function: nuclear membrane, nucleolus, nuclear bodies (PcG, PML, OPT, SNB etc.)
Chromosome structure (different models: human, insect, yeast), microscopy of chromosomes, composition – chromosome scaffold and nucleosomes, different chromosome models, heterochromatin, euchromatin, gene silencing, DNA methylation and CpG islands
Cell cycle, cell nucleus changes, cell cycle phases, cell cycle regulation (cyclin dependent kinases, cyclins, DNA damage)
Mitosis – G1, S, G2 and M phase (sub-phases), cytokinesis and immortal cells
Meiosis – I. and II. meiotic cell division, cytokinesis, male and female meiosis, chromosome nondisjunction, plant meiosis
Chromosome aberrations, (characterization and classification), evaluation of chromosome defects, meiosis of polyploid organisms, mechanisms leading to chromosome aberrations
Fluorescent microscopy–basic principles and applications

Confocal microscopy and latest microscopy methods
Molecular cytogenetics/pathology, cytogenetics methods, cancer cytogenetics and diagnostics

Recommended literature:

Snustadt, D.P., Simmons, M.J. (2009). Genetika. MUNI Press, Masarykova univerzita, Brno.
Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M., Veres, R.C. (2008). Genetics: From Genes to Genomes. 3rd Edition. McGraw-Hill, International Edition.
Russell, P.J. (2006). iGenetics: A Molecular Approach. 2nd Edition. Pearson/Benjamin Cummings. International Edition.
Morgan D. O. (2006). The Cell Cycle: Principles of Control. OUP/New Science Press Primers in Biology

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 3

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

Lecturers: prof. RNDr. Andrea Ševčovičová, PhD., doc. Mgr. Miroslava Slaninová, Dr., doc. RNDr. Eliška Gálová, PhD., Mgr. Katarína Gaplovská, PhD.

Last change: 14.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 874

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

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

Last change: 05.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 2.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 542

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

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

Last change: 05.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 3.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 191

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

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

Last change: 05.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 4.

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

Prerequisites:

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 104

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

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

Last change: 05.09.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1., 3.

Educational level: I., I.II.

Prerequisites:

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

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

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

Recommended literature:

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

Languages necessary to complete the course:
Slovak

Notes:

Past grade distribution
Total number of evaluated students: 124

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

Lecturers: Mgr. Ľudmila Hlinová

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites:

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

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

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

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

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

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 127

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

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

Last change: 28.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, 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-AIN-112/22	Introduction to Web Technologies

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

Number of credits: 6

Recommended semester: 1.

Educational level: I.

Prerequisites:

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

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

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

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

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

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1754

A	B	C	D	E	FX
31,87	11,29	11,97	13,85	12,03	18,99

Lecturers: PaedDr. Roman Hrušecký, PhD.

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-BMF-331/18	Introductory Biostatistics

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

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites:

Recommended prerequisites:
-

Course requirements:
Preliminary evaluation: homeworks
Final exam: oral / written written and oral exam
Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
On completion of the course, students will gain knowledge of the basic principles of scientific research methodology - they will be able to identify and apply different research types, and research designs. They will master the most commonly used statistical methods for biological and clinical data analysis and be able to work with statistical software and Excel add-ins.

Class syllabus:
Basic principles of scientific research methodology. Probability, random variable and its characteristics, types of probability distributions, basic concepts of applied statistics. Data collection, cleaning, sorting and coding, types, scales of variables, descriptive statistics, summarisation and presentation of data. Point and interval estimates, the concept of statistical hypothesis testing, P-value, interpretation of hypothesis testing results, statistical and biological significance. Analysis of categorical data, proportions, contingency tables, case classification, diagnostic tests. Comparison of sample means, t-tests. Analysis of variance. Nonparametric methods. Correlation and simple linear regression. Introduction to multivariable analysis. Practical part: solving real biomedical problems using statistical software Statsdirect and MS Excel with an add-in programmed in MS Visual Basic® for Application (VBA).

Recommended literature:
Lepš, J., Šmilauer, P. (2016). Biostatistika. Episteme, Nakladatelství JU, České Budějovice, 438 s. ISBN: 978-80-7394-587-9
Waczulíková, I., Slezák, P. (2015). Introductory Biostatistics. Bratislava: Comenius University, 1st Edition. 147 p. ISBN 978-80-223-3938-4.

Somorčík, J., Teplička, I. (2015). Štatistika zrozumiteľne. Bratislava : Enigma, 1. vydanie, 2015, 244 s. ISBN 9788081330421.
Zvárová J. (2011). Základy statistiky pro biomedicínské obory. Praha : Karolinum. 218 p. ISBN 80-7184-786-0
Motulsky, H. (2014). Intuitive Biostatistics. New York : Oxford University Press, 3rd Edition, 2014, 540 p. ISBN 987-0-19-994664-8.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 64

A	B	C	D	E	FX
64,06	25,0	6,25	4,69	0,0	0,0

Lecturers: prof. RNDr. Iveta Waczulíková, PhD., Mgr. Šimon Šutý, PhD.

Last change: 25.05.2025

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KGe/1-BIN-212/15	Lab Math

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

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Antirequisites: PriF.KGe/N-bBGE-003/15

Course requirements:
Course requirements: (i) attendance at seminars, (ii) a written test. At least 60% of points must be obtained in the test. The remainder is divided into 5 intervals corresponding to the A-E rating (60-68% = E; 69-76% = D; 77-84% = C; 85-92% = B; 92-100% = A)
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
The aim of the seminar is:
(i) to teach students to do calculations for work in a molecular genetics laboratory,
(ii) practice solving more complex problems from genetics,
(iii) to teach students to statistically process and interpret the results of experimental work.

Class syllabus:
problems focused on statistical evaluation of experiments.

Recommended literature:
Snustadt, D.P., Simmons, M.J. (2009). Genetika. MUNI Press, Masarykova univerzita, Brno.
Lukáčová, Z. (2022) ZÁKLADY BIOŠTATISTIKY - Sprievodca základnými štatistickými metódami pre biológov, Vyd. © Ľubica Cibulková – LPC, ISBN 978 – 80 – 973923 – 1 – 4

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 9

A	B	C	D	E	FX
55,56	11,11	0,0	11,11	22,22	0,0

Lecturers: prof. RNDr. Andrea Ševčovičová, PhD., Mgr. Mária Peťková, PhD.

Last change: 15.08.2025
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-Prif.KBCh/1-BIN-317/22	Laboratory Practicals in Biochemistry and Cell Biology

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

Number of credits: 2

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI-PriF.KBCh/1-BIN-303/22 - Essential Cell Biology

Course requirements:
The requirement for completing the course is systematic preparation, including the study of instructions, active problem solving in the practicals and the submission of written reports (protocols) after the practicals.
A: at least 92%, B: at least 84%, C: at least 76%, D: at least 68%, E: at least 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will practically verify some of the knowledge acquired during lectures and get acquainted with basic biochemical and molecular-biological methods.

Class syllabus:
DNA properties and analysis - Students will get acquainted with basic methods of DNA analysis, such as techniques for the preparation of recombinant DNA molecules, including DNA isolation, PCR methods, restriction analysis and gel electrophoresis.
Protein properties and analysis - Students will try protein isolation and analysis techniques involving polyacrylamide gel electrophoresis and antibody immunodetection.

Recommended literature:
Voet, D., Voetová, J.G. Biochemie. 1. české vyd. Praha: Victoria Publishing, 1995, 1325 s. ISBN 80-85605-44-9;
Vodrážka, Z. Biochemie. 2., opr. vyd. Praha: Academia, 1996, 180, 135, 191 s. ISBN 80-200-0600-1. Dotlač 2007;
Mikušová, K. - Kollárová, M.: Princípy biochémie: V schémach a v príkladoch. Bratislava: Univerzita Komenského, 2005, 2008, 2013, 164 s. ISBN 978-80-223-2567-7;
Berg, J.M., Tymoczko, J.L., Gatto, G.J. a Stryer, L. Biochemistry. MacMillan 2019, ISBN 978-1319114657;
Návody k úlohám budú poskytnuté vopred učiteľmi cvičenia.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 23

A	B	C	D	E	FX
82,61	17,39	0,0	0,0	0,0	0,0

Lecturers: Mgr. Petra Chovančíková, PhD.

Last change: 18.09.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-Prif.KAgCh/1-BIN-106/22	Laboratory Practicals in Chemistry

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

Number of credits: 2

Recommended semester: 1.

Educational level: I.

Prerequisites:

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

Learning outcomes:
During laboratory exercises students will acquire skills in basic laboratory tasks necessary for other courses in natural sciences.

Class syllabus:
Basic laboratory equipment and operations. Purification by recrystallization. Controling the rate of chemical reactions. Preparation of solutions by dilution and mixing. Demonstration reactions of selected inorganic cations and anions. Determination of equivalence point of neutralization reactions. Determination of unknown sulfuric acid solution concentration. Hydrolysis of salts. Preparation of KHSO4 (acid-base reaction).

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 33

A	B	C	D	E	FX
36,36	9,09	18,18	18,18	3,03	15,15

Lecturers: RNDr. Jana Chrappová, PhD., Mgr. Dominika Lacušková

Last change: 30.01.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-Prif.KAgCh/1-BIN-106/22	Laboratory Practicals in Chemistry

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

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

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

Learning outcomes:
During laboratory exercises students will acquire skills in basic laboratory tasks necessary for other courses in natural sciences.

Class syllabus:
Basic laboratory equipment and operations. Purification by recrystallization. Controling the rate of chemical reactions. Preparation of solutions by dilution and mixing. Demonstration reactions of selected inorganic cations and anions. Determination of equivalence point of neutralization reactions. Determination of unknown sulfuric acid solution concentration. Hydrolysis of salts. Preparation of KHSO4 (acid-base reaction).

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 33

A	B	C	D	E	FX
36,36	9,09	18,18	18,18	3,03	15,15

Lecturers: RNDr. Jana Chrappová, PhD., Mgr. Dominika Lacušková

Last change: 30.01.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 3

Recommended semester: 2., 4., 6.

Educational level: I., I.II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 172

A	B	C	D	E	FX
37,79	23,84	15,12	11,05	5,23	6,98

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-DAV-104/20	Linear Algebra

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

Number of credits: 7

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Ongoing evaluation during the semester: quizzes, homeworks, midterms
Final exam: written and oral
Approximative grade scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Presentation of the basic concepts of algebraic methods with focus on their use in informatics.
After completing the course, students will be familar with the fundamentals of linear algebra needed in informatics and computer graphics, including the algorithms: Matrices and matrix operations, linear dependence and independence, dimension of a vector space, determinants, the concept of a group, specific matrix groups, systems of linear equations and their solution, solution spaces, vector spaces, scalar product, orthogonal complement, linear transformtaions and their matrices, injectivity, surjectivity, linear and affine spaces, eigenvectors and eigenvalues

Class syllabus:
Systems of linear equations and the corresponding geometry, Gauss-Jordan elimination, matrix notation, vectors, matrix operations, inverse matrix, vector spaces, solutions spaces of homogeneous systems and their bases, linear dependence/independence, basis, dimension, rank of a matrix, linera transformations, kernel, image, scalar product, orthogonality, orthogonal projections, angle between vectors, orthogonal complement, Gram-Schmidt orthonormalization, determinant, characteristic polynomial, eigenvectors and eigenvalues, Laplace expansion, Cramer's rule, fileds, rings, permutations.

Recommended literature:
Lineárna algebra a geometria I / Július Korbaš. Bratislava : Univerzita Komenského, 2003
Lineárna algebra a geometria : Cesta z troch rozmerov s presahmi do príbuzných odborov / Pavol Zlatoš. Bratislava : Albert Marenčin, 2011
Applied linear algebra and matrix analysis / Thomas S. Shores. New York : Springer, 2007
Linear algebra done right / Sheldon Axler. New York : Springer, 1997

Languages necessary to complete the course:

Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 194

A	B	C	D	E	FX
15,98	15,46	19,07	22,16	13,92	13,4

Lecturers: prof. RNDr. Róbert Jajcay, DrSc., Mgr. Martin Niepel, PhD., Mgr. Štefánia Glevitzká

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-BIN-210/22	Mathematics for Biologists

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: 4.

Educational level: I.

Prerequisites:

Antirequisites: PriF-FMFI.KAMŠ/N-bBXX-082/15 and FMFI.KAMŠ/1-BIN-210/15

Course requirements:
Homeworks (20% of the grade), midterm test (30% of the grade), final exam. A 90%, B 82%, C 75%, D 68%, E 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Acquisition of basic knowledge about the possibilities and methods of using mathematics in biology, reading and drawing graphs, use of basic statistics. Ability to analyze simple problems using dynamic systems.

Class syllabus:
Principles of mathematical modeling in natural sciences. Data and their graphical display. Linear dependence, exponential and logarithmic functions and their practical use. Derivatives, integrals, vectors and matrices, their significance and practical use in models in cell biology, biochemistry, virology, molecular biology, genetics, ecology and other fields. Fundamentals of dynamic systems: acquaintance with concepts: system of ordinary differential equations, vector, matrix, phase portrait analysis, properties of equilibria and oscillations. Basics of probability and statistics.

Recommended literature:
E. N. Bodine, S. Lenhart, L. J. Gross, Mathematics for Life Sciences, Princeton University Press, 2014
K. A. Strout, Engineering Mathematics, 7th ed, Palgrave MacMillan, 2013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 9					
A	B	C	D	E	FX
55,56	44,44	0,0	0,0	0,0	0,0
Lecturers: doc. Mgr. Richard Kollár, PhD.					
Last change: 12.03.2022					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 6

Recommended semester: 5.

Educational level: I., II.

Prerequisites:

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

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

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

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 263

A	B	C	D	E	FX
28,14	16,73	21,29	18,25	7,22	8,37

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Askar Gafurov, PhD.
Last change: 14.01.2025
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI-PriF.KBCh/1-BIN-314/22	Methods in Molecular and Cell Biology

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: 6.

Educational level: I.

Prerequisites: FMFI-PriF.KBCh/1-BIN-303/22 - Essential Cell Biology

Antirequisites: PriF.KBCh/N-bCBI-018/15

Course requirements:
There will be regular written tests during the semester. Credits will not be awarded to a student who obtains less than 50% of the overall evaluation of the tests. The course will be completed by an oral exam. The evaluation will be given as follows: A - excellent results, B - above-average work, C - normal reliable work, D - acceptable results, E - results meeting the minimum criteria, Fx - insufficient results (knowledge of less than 60% of the course content).
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, students will have an overview of key methods and experimental approaches used in molecular and cell biology.

Class syllabus:
Principles of preparation of recombinant DNA molecules. Construction of gene libraries (genomic and cDNA). Properties and types of vectors. Recombinant selection and analysis. Enzymes in recombinant DNA techniques. Nucleic acid hybridization and preparation of molecular probes. Labeling of DNA and RNA molecules, radioactive and non-radioactive techniques. Southern and Northern blotting, in situ hybridization, subtractive hybridization, PNA and antisense probes. DNA microchip technology. Polymerase chain reaction (PCR). Principle and variations of the technique: asymmetric PCR, inverse PCR, reverse transcriptase PCR, quantitative PCR. Isothermal amplification of nucleic acids. Nucleic acid sequencing. First, second and third generation sequencing technologies. In vitro and in vivo mutagenesis. Methods of site-directed mutagenesis and its practical use. Gene disruptions and gene replacements. Molecular evolution in vitro. Preparation of aptamers and nucleic acids with catalytic activity in vitro. SELEX. Principles of heterologous gene expression. Expression systems. Host strains. DNA transfer techniques into cells. Preparation of recombinant proteins. Methods for isolation and investigation of proteins (electrophoretic methods, native and denaturing electrophoresis, isoelectric focusing, chromatographic methods, Western blotting, immunological methods). Methods of protein

interaction analysis (DNA-protein, RNA-protein, protein-protein: DNase I footprinting, gel retardation, NC filter binding assay, one-, two- and three-hybrid system, reverse two-hybrid system, chemical crosslinking). Microscopic methods (light, fluorescence and electron microscopy, use of green fluorescent protein).

Recommended literature:

Watson, J.D. a kol. (2007) Recombinant DNA: Genes and Genomes – A short course. 3rd edition. CSHL Press.
Alberts B., Johnson A., Lewis J., Raff M., Roberts K., Walter P. (2014) Molecular Biology of the Cell, Garland Science.
Lodish et al. (2016) Molecular Cell Biology. 8th Edition, W. H. Freeman and Company.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
36,36	45,45	18,18	0,0	0,0	0,0

Lecturers: doc. Mgr. Peter Polčic, PhD., Ing. Martina Neboháčová, PhD., prof. RNDr. Jozef Nosek, DrSc., Mgr. Katarína Procházková, PhD.

Last change: 13.09.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-DAV-103/20	Operating Systems and Computer Networks

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

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Activity during lectures and exercises (50%), written test (50%). Activity during lectures and exercises (50%), written test (50%)
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, students will have an overview of the principles of computer operation, the tasks and principles of operating systems and the principles of operation and secure use of computer networks and their services. They will also gain command line skills on the Linux operating system.

Class syllabus:
Basic concepts of computer systems (processor, memory, input-output devices).
Basic concepts of operating systems, processes, memory management, input and output management, file systems, access control, virtualization.
Basic concepts of computer networks, reference model OSI, TCP/IP, e-mail and web, security aspects.
Basics of using the command line in the Linux operating system. Users, groups, redirection, searching. File and folder management. Basic tools (vim, awk, sed, bash scripts).

Recommended literature:
Computer networks / Andrew S. Tanenbaum. Upper Saddle River : Prentice-Hall, 2003
Operating systems : Internals and design principles / William Stallings. Upper Saddle River : Pearson/Prentice Hall, 2005
Teachers' own electronic texts published on the course's web page.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 246					
A	B	C	D	E	FX
39,43	23,17	10,57	8,54	4,47	13,82
Lecturers: doc. RNDr. Daniel Olejár, PhD., RNDr. Jaroslav Janáček, PhD., Mgr. Marek Šuppa					
Last change: 22.06.2022					
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.					

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 2., 4., 6.

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

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 202

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

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 1., 3., 5.

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

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 202

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

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI+KAI/1-BIN-105/15	Perspectives of the Current Bioinformatics

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

Number of credits: 2

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
To complete the course, students have to actively participate in all field trips and submit an essay from one field trip. The grade is given based on the essay. Grades A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be familiar with the areas of biomedical research in which bioinformatics plays a key role, particularly in the context of the research groups in Slovakia

Class syllabus:
Presentations of research groups of Comenius University, Slovak Academy of Sciences and other institutions with emphasis on the role of bioinformatics in research, typically in the form of a field trip to a particular research facility.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 64

A	B	C	D	E	FX
89,06	0,0	0,0	0,0	1,56	9,38

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD.

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 0

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

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

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

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 7493

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

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

Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová
Last change: 16.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 1

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

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

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

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 5850

A	B	C	D	E	FX
95,61	1,5	0,14	0,09	0,05	2,62

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

Mgr. Branislav Nedbálek, PhD., Mgr. Tomáš Lovecký, Mgr. Martina Maheľová, PaedDr. Lucia Ondrušová
Last change: 15.03.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

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

Learning outcomes:

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 3440

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

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

Last change: 16.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

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

Learning outcomes:

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2957

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

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

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 5.

Educational level: I., I.II.

Prerequisites:

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

Learning outcomes:

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 2264

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

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

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 1

Recommended semester: 6.

Educational level: I., I.II.

Prerequisites:

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

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

Learning outcomes:

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 205

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

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

Last change: 15.03.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 3

Recommended semester: 3.

Educational level: I.

Prerequisites:

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

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

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

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 250

A	B	C	D	E	FX
23,2	18,0	17,6	18,0	8,0	15,2

Lecturers: doc. RNDr. Robert Lukoťka, PhD.

Last change: 07.02.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

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

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

Number of credits: 2

Recommended semester: 5.

Educational level: I.

Prerequisites:

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

Learning outcomes:
Students extends their overwiew of modern trends in software development; they can distinguish good and bad practices.

Class syllabus:
Programming paradigms, type checking, good practices handling concurrency and parallelism (immutable data structures, futures and promises, introduction to asynchronous programming), databases – types and guarantees, architecture, architectural styles and patterns, stateless services, documentation and maintanence, management of SW projects, SCRUM, estimations, lean startup.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 104

A	B	C	D	E	FX
17,31	19,23	23,08	20,19	9,62	10,58

Lecturers: doc. RNDr. Robert Lukoťka, PhD., RNDr. Jana Kostičová, PhD.

Last change: 03.02.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KDMFI/1-AIN-130/22	Programming (1)

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

Number of credits: 9

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KAI/1-AIN-130/13

Course requirements:
Continuing evaluation: homework assignments (30%)
Exam: midterm (20%) , written exam (50%)
To successfully complete the course, student has to obtain at least 50% of points
Final grade: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will gain basic programming skills in the Python object-oriented programming language, become familiar with the basic data structures of the language, and gain their first skills with object-oriented programming.

Class syllabus:
Python programming language development environment;
programs, functions, recursion, modules;
data structures, lists, strings, files, dictionaries, sets;
graphical applications, events;
object-oriented programming, inheritance, polymorphism.

Recommended literature:
Summerfield: Programming in Python 3, Addison-Wesley Professional 2009
Miller: How to Think Like a Computer Scientist: Interactive Edition, web: http://interactivepython.org/runestone/static/thinkcspy/index.html

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 1400

A	B	C	D	E	FX
27,64	10,5	10,86	7,5	11,64	31,86

Lecturers: RNDr. Andrej Blaho, PhD., PaedDr. Andrea Hrušecká, PhD., PaedDr. Daniela Bezáková, PhD., Mgr. Štefan Pócoš, PhD.

Last change: 26.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KDMFI/1-AIN-170/22	Programming (2)

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

Number of credits: 7

Recommended semester: 2.

Educational level: I.

Prerequisites: FMFI.KAI+KDMFI/1-AIN-130/22 - Programming (1)

Course requirements:
Continuing evaluation: homework assignments (30%)
Exam: midterm (20%) , written exam (50%)
To successfully complete the course, student has to obtain at least 60% of points
Final grade: A 88%, B 81%, C 74%, D 67%, E 60%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be introduced to more advanced linked data structures and basic algorithms on these structures.

Class syllabus:
more advanced data structures: stacks, queues, linked lists, trees, graphs
various applications and basic algorithms with linked data structures
basic sorting, searching and generating algorithms

Recommended literature:
Miller, Ranum: Problem Solving with Algorithms and Data Structures using Python, Interactive Edition, web: http://interactivepython.org/runestone/static/pythonds/index.html

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1127

A	B	C	D	E	FX
34,78	12,87	11,27	9,23	13,75	18,1

Lecturers: RNDr. Andrej Blaho, PhD., Mgr. Štefan Pócoš, PhD.

Last change: 26.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, 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-AIN-171/22	Programming (3)

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

Type, volume, methods and workload of the student - additional information
Principles of Object Programming, Learning Programming Language C++, developing algorithmic skills, principles of agile programming , Training Test Driven Development Methodology, learning clean code programming and demonstrating errors we make.

Number of credits: 5

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Continuing evaluation: homework assignments (40%))
Exam: written with oral consultation (33%)
Project: (27%)
To successfully complete the course, student has to obtain at least 75% of points on the homework assignement and to obtain at least 60% of points on the final exam.
Final grade: A 90%, B 86%, C 80%, D 70%, E 60%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
The students will be able to use learned algorithms to design object programs in C++ language, they will be able to solve practical assignments and independently propose and implement application in the language. They will be able to employ the methodology of test-driven programming.

Class syllabus:
Statements, variable types, arrays, multi-dimensional arrays
Functions, operators and their overloading
Pointers, arrays, pointers to pointers, pointers to functions
Global, local, static variables, type definitions
Structures, classes
Class hierarchy, abstract classes, dynamic inheritance, multiple inheritance
Class constructors and destructors
Function and method arguments, return values
Streams, work with files
Templates, STL, intelligent pointers
Exceptions

Parallelism

Recommended literature:

1. Virius, Miroslav, Jazyky C a C++, Grada, 2011
2. Virius, Miroslav, 1001 tipů a triků pro C++, Computer Press, a.s., Brno 2011
3. Sutter, Herb, Alexandrescu, Andrei, C++ - 101 programovacích technik, Addison-Wesley, Zoner Press, Brno, 2005
4. Eckel, Bruce, Myslíme v C++, Grada, 2000
5. Eckel, Bruce, Allison, Chuck, Myslíme v C++ (2. díl), Grada, 2006
6. Virius, Miroslav, Pasti a propasti jazyka C++, 2. aktualizované a rozšířené vydání, CP Books, Computer Press, Brno, 2005

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1469

A	B	C	D	E	FX
40,3	13,34	10,42	9,39	10,76	15,79

Lecturers: Ing. František Gyarfaš, CSc., Mgr. Ivor Uhliarik, PhD.

Last change: 24.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-161/00	Russian Language (1)

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

Number of credits: 2

Recommended semester: 1.

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

Prerequisites:

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

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
To master the fundamentals of general Russian. The language level is A1.
Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts.
The subject provides a course in Russian language for beginners.

Recommended literature:
The textbook: : Точка Ру A1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 746

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

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-162/00	Russian Language (2)

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

Number of credits: 2

Recommended semester: 2.

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

Prerequisites:

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

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
To master the fundamentals of general Russian.
Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts.
The subject continues the program of Russian language (1) and provides a course of Russian for beginners.

Recommended literature:
Textbook: Точка Ру A1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко).

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 435

A	B	C	D	E	FX
63,91	16,09	8,97	3,91	0,92	6,21

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-261/00	Russian Language (3)

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

Number of credits: 2

Recommended semester: 3.

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

Prerequisites:

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

Learning outcomes:
Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing.

Class syllabus:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
Точка Ру A2 (Ольга Долматова, Екатерина Новачац) a Short Stories in Russian (Olly Richards, Alex Rowlings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 215

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

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-262/00	Russian Language (4)

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

Number of credits: 2

Recommended semester: 4.

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

Prerequisites:

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

Learning outcomes:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.

Class syllabus:
Learning the handwritten Russian (Russian Cursive Cyrillic), developing further language skills, gaining knowledge of Russian culture, history and way of life, pre-intermediate to intermediate grammar and vocabulary.
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
Точка Ру A2 (Ольга Долматова, Екатерина Новачац) a Short Stories in Russian (Olly Richards, Alex Rowlings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 153

A	B	C	D	E	FX
74,51	14,38	7,19	2,61	0,65	0,65

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-IKVa-192/19	Science, Technology and Humanity: Opportunities and Risks

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

Number of credits: 5

Recommended semester: 2.

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

Prerequisites:

Course requirements:
Semestral evaluation: active participation
Final evaluation: essay
Weight of the final evaluation: 60%
To achieve an A, 90% is needed, for B at least 80%, for C 70%, for D, 60% and for an E, at least 50% of overall assessment.

Learning outcomes:
The students will gain awareness of the contemporary and potential future challenges posed by scientific and technological innovations and their impact on human behaviour, culture and society.

Class syllabus:
Big data: privacy, politics and power,
Internet of things, it usefulness and threats,
Assistant AI and its place in future society,
Job market and inequality,
Enhancements and human rights and the right to change self and others,
Initiatives for responsible research,
Artificial minds,
Hybridization between species and between AI and organic minds,
Future of minds and trans-humanism,
Artificial emotional intelligence,
An after human era.

Recommended literature:
- S. Russell: Human compatible. Artificial intelligence and the problem of control. Viking, 2019.
- J. Havens: Heartificial intelligence. Embracing our humanity to maximize machines. Penguin, 2016.
- P. Boddington: Towards a code of ethics for artificial intelligence. Springer, 2017.
- M. Shanahan: The technological singularity. MIT Press, 2015.

- C. MacKellar, C.: Cyborg Mind: What Brain–Computer and Mind–Cyberspace Interfaces Mean for Cyberneuroethics. Berghahn Books, 2019.
- G. Bel, J. Gemmell: Total Recall, How the e-Memory Revolution will change everything. Dutton, 2009.
- S. Zuboff: The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. PublicAffairs, 2019.
- C. O'Neil: Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy. Crown Publishers, 2016.
- M. Tegmark: Life 3.0. Allen Lane, 2017.

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 146

A	B	C	D	E	FX
40,41	21,92	16,44	6,85	4,79	9,59

Lecturers: doc. RNDr. Martin Takáč, PhD., PhDr. Ing. Tomáš Gál, PhD.

Last change: 28.02.2020

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-171/20	Slovak Language for Foreign Students (1)

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

Number of credits: 2

Recommended semester: 1.

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

Prerequisites:

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

Learning outcomes:
This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.

Class syllabus:
The sylabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1).

Recommended literature:
Krížom- Krážom Slovenčina 1, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 155

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

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-172/20	Slovak Language for Foreign Students (2)

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

Number of credits: 2

Recommended semester: 2.

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

Prerequisites:

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

Learning outcomes:
This course is aimed for foreign students to learn the fundamentals of the Slovak language with the focus on basic communication as well as all other language skills- listening comprehension,reading and writing.

Class syllabus:
The sylabus is targeted at the comprehension of the basics of the Slovak language for the absolute beginners (A1) and this course is a follow up course to the Slovak language course 1.

Recommended literature:
Krížom- Krážom Slovenčina 1, additional material to further support the covered topics

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 87

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

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-271/20	Slovak Language for Foreign Students (3)

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

Number of credits: 2

Recommended semester: 3.

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

Prerequisites:

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

Learning outcomes:
This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.

Class syllabus:
The sylabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 2.

Recommended literature:
Krížom-Krážom Slovenčina 2, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 32

A	ABS	B	C	D	E	FX	NEABS
59,38	3,13	18,75	3,13	3,13	0,0	12,5	0,0

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-272/20	Slovak Language for Foreign Students (4)

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

Number of credits: 2

Recommended semester: 4.

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

Prerequisites:

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

Learning outcomes:
This course is aimed for foreign students to better comprehend all the language skills important to enable correct usage of the Slovak language – listening comprehension, reading, writing and speaking.

Class syllabus:
The sylabus is targeted at the comprehension of all the language skills of the Slovak language , and it is a follow up course to the Slovak language course 3.

Recommended literature:
Krížom-Krážom Slovenčina 2, additional material to further support the covered topics.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 25

A	ABS	B	C	D	E	FX	NEABS
84,0	0,0	4,0	4,0	0,0	0,0	8,0	0,0

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, 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-INF-175/00	Social Aspects of Informatics

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

Number of credits: 2

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KDMFI/1-UXX-332/22

Course requirements:
Three essays submittied during the semester, each for 15 points. Grades: A 41-45 points, B 36-40, C 31-35, D 26-30, E 21-25.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will be motivated to think about the impact of information and communication technologies on our lives. Students will be familiar with historical perspective of this impact.

Class syllabus:
New ICT are developed and improved very rapidly. They are becoming an invisible part of our everyday life. We try to look at changes introduced by ICT, what positive they are introducing and what the risks are too. We try to analyse different areas of society: education system, medical care, arts, business, finance, manufacturing, etc. Especially we deal with Slovak copyright law and computer crime.

Recommended literature:
Abelson,Ledeen, Lewis, BlownTo Bits, Addison Wesley 2008, www.bitsbook.com
Materials shared at the course website

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1914

A	B	C	D	E	FX
70,01	8,31	4,23	10,82	2,87	3,76

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

Last change: 21.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-115/15	Sports in Nature (1)

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

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%.
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 310

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

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

Last change: 16.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-215/15	Sports in Nature (2)

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

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide sports equipment.

Past grade distribution
Total number of evaluated students: 298

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

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-216/18	Sports in Nature (3)

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

Number of credits: 1

Recommended semester: 3.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-151/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Acquisition and development of basic motor skills and abilities in selected sports: skiing and snowboarding. Mastering the correct technique of performing individual movements, which are necessary for skiing and snowboarding.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: skiing, snowboarding. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ does not rent ski equipment.

Past grade distribution
Total number of evaluated students: 58

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

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-217/18	Sports in Nature (4)

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

Number of credits: 1

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites:

Antirequisites: FMFI.KTV/1-UXX-152/22

Course requirements:
Grades: A 90%, B 80%, C 70%, D 60%, E 50%
The condition for the award of 1 or 2 credits is the completion of a multi-day course in its full scope, or the completion of one-day courses in the scope of 4 days. Candidates can apply to the leaders of individual courses. From the presented offer of courses, you can choose the one that suits your interests, abilities and deadlines.

Learning outcomes:
Creating a positive and lasting relationship with physical activity. Acquisition and mastery of basic motor skills and abilities in outdoor sports: windsurfing, beach volleyball, water tourism - river rafting, hiking and other sports according to interest. Training and improving the technique needed for the sports.

Class syllabus:
The student can sign up for the outdoor sports courses offered by the department: water tourism - river rafting, windsurfing, beach volleyball, hiking and other hobby sports. The lessons in the courses are focused on the development of basic and special movement skills and, mastering the techniques needed for the sports.

Recommended literature:

Languages necessary to complete the course:
Slovak

Notes:
KTVŠ will provide material equipment.

Past grade distribution
Total number of evaluated students: 41

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

Lecturers: Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD., Mgr. Tomáš Lovecký
Last change: 16.06.2022
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-133/18	Supplementary English Course (1)

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

Number of credits: 2

Recommended semester: 1.

Educational level: I., I.II.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 credit - ongoing evaluationMinimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course.A 100-93 %B 92-85 %C 84-77 %D 76-70 %E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form.
Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998
Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 72

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

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024
Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-134/18	Supplementary English Course (2)

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

Number of credits: 2

Recommended semester: 2.

Educational level: I., I.II.

Prerequisites:

Course requirements:
tests, homework
Scale of assessment (preliminary/final): 100/0 ENcredit - ongoing evaluation Minimum 65 percent of the total points for the assigned work is needed to pass the course. Points can be awarded for attendance, completed homework tasks, and short tests assigned during the course. A 100-93 % B 92-85 % C 84-77 % D 76-70 % E 69-65 %Course prerequisites:https://fmph.uniba.sk/microsites/kjp/katedra-jazykovej-pripravy/poziadavky-na-udelenie-priebezneho-hodnotenia-aj1aj2aj3-ostatne-kurzy/

Learning outcomes:

Class syllabus:
Texts dealing with the most important topics for FMPI majors combining grammar revision with vocabulary needed to pass the A4 English exam.

Recommended literature:
Study materials are created by the teacher and available in electronic form. Raymond Murphy: Essential Grammar in USe, Cambridge University Press, 1998 Michael McCarthy, Felicity O'Dell: English Vocabulary in Use, Cambridge University Press, 1994

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 72

A	B	C	D	E	FX
54,17	13,89	4,17	8,33	5,56	13,89

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/1-INF-526/15	System Programming

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

Number of credits: 6

Recommended semester: 4.

Educational level: I.

Prerequisites:

Recommended prerequisites:
The course requires knowledge of the C programming language.

Course requirements:
Project (during semester), written final test (at least 50% needed) and oral final exam (may be waived)
Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Students will be familiar with principles and methods of system programming and will have a practical experience with their use.

Class syllabus:
(1) Fundamentals of system programming
data representation, assembler, instruction types, address modes, program structure in GNU as, linking programs, calling conventions, stack manipulation, libraries, loading and executing programs
(2) IA-32 architecture and X86-64 architecture
basic architecture, registers, selected instructions, memory models, virtual memory
(3).Selected system calls of UNIX systems
Starting and temrinating processes, input/output, network communication, terminal, signals

Recommended literature:
Custom course notes published on the course website. Publicly available web resources.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 429

A	B	C	D	E	FX
9,09	9,09	15,85	16,08	29,6	20,28

Lecturers: RNDr. Jaroslav Janáček, PhD., Ing. Dušan Bernát, PhD., doc. RNDr. Robert Lukoťka, PhD.

Last change: 22.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-176/15	Unix for System Administrators

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

Number of credits: 6

Recommended semester: 5.

Educational level: I., II.

Prerequisites:

Course requirements:
Practical assignments (both during the semester and on final exam)
Approximate grading scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course the students will know the principles of UNIX system administration and they will be able to practically carry out the basic duties of a system administrator.

Class syllabus:
users, groups, passwords
access permissions for files and directories, ACL
filesystem structure
character and block devices
special filesystem objects (symlink, pipe)
mounting and unmounting of filesystems to the directory hierarchy (mount, umount, /etc/fstab)
creating filesystems
system startup and shutdown - /etc/inittab, runlevels
job scheduling (cron, at, batch)
TCP/IP configuration (ifconfig, route)
network services (/etc/services, /etc/inetd.conf, /etc/protocols, /etc/hosts, ...)
DNS – client (/etc/resolv.conf)
DNS – server
NFS
Firewall
SystemD
Assumptions:
good user-level knowledge of UNIX systems, directory hierarchy navigation, creating and editing files (vi, joe), shell programming (sh/bash), commands find, grep, cat, cut, ls, awk.

Recommended literature:

Course notes provided on the course website, freely available electronic materials

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 311

A	B	C	D	E	FX
16,4	29,58	26,05	13,83	9,65	4,5

Lecturers: RNDr. Jaroslav Janáček, PhD., Ing. Dušan Bernát, PhD., doc. Mgr. Tomáš Plachetka, Dr.

Last change: 22.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.

COURSE DESCRIPTION

Academic year: 2026/2027	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KDMFI/1-AIN-189/22	**Course title:** Web Applications (1)
Educational activities: **Type of activities:** lecture / practicals **Number of hours:** **per week:** 2 / 2 **per level/semester:** 26 / 26 **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 2.	
Educational level: I.	
Prerequisites:	
Recommended prerequisites: 1-AIN-112 Introduction to web technologies	
Antirequisites: FMFI.KZVI/1-AIN-615/00	
Course requirements: Intermediate assessment: practical assignments, project (max 20%) Exam: practical (at least 70% of the semester points are needed) Indicative evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 20/80	
Learning outcomes: After completing the course, students will be able to create a simple server-side web application with personalized access to individual parts of the application. The data will be stored in a database.	
Class syllabus: - Server-side web applications - Introduction to PHP - Basic language structures (1) - Variables, constants, strings, operators, conditions, loops - Basic language structures (2) - working with date and time, arrays, functions to work with arrays and strings - Reusing code - Form processing, input processing and treatment - SESSION, COOKIES - Introduction to working with a database - Basic database queries - SELECT, INSERT, UPDATE, DELETE - Linking PHP to the database - Working with multiple tables at the same time	

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

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 1081

A	B	C	D	E	FX
40,24	12,4	10,18	10,64	9,81	16,74

Lecturers: PaedDr. Roman Hrušecký, PhD., RNDr. Marek Nagy, PhD., prof. RNDr. Zuzana Kubincová, PhD.

Last change: 21.06.2022

Approved by: prof. RNDr. Ľubomír Tomáška, DrSc., doc. Mgr. Bronislava Brejová, PhD.