Course descriptions

TABLE OF CONTENTS

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-TEF-115/22	Algebra and Geometry (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: 1.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:
After completing the course the student will master the basic concepts and methods of linear algebra will be able to use them in geometry and physics.

Class syllabus:
Sets and maps, fields and vector spaces, basics of matrix calculus, systems of linear equations, linear subspaces and linear independence, basis and dimension, linear representations, matrix of linear representation, inverse matrices and transition matrices, base change, affine subspaces, determinants.

Recommended literature:
Linear Algebra and Geometry: A Journey of Three Dimensions with Overlaps in Related Fields / Pavol Zlatoš. Bratislava: Albert Marenčin, 2011; electronic version available at http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf
We grow linear algebra / Luboš Motl, Miloš Zahradník. Prague: Karolinum, 2002
Lectures on Linear Algebra and Geometry / Július Korbaš, Štefan Gyurki. UK Publishing House, Bratislava, 2013

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 546

A	B	C	D	E	FX
13,37	18,5	18,13	17,03	21,61	11,36

Lecturers: prof. RNDr. Pavol Zlatoš, PhD., Mgr. Marián Poturnay

Last change: 09.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAG/1-TEF-160/22	Algebra and Geometry (2)

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

Number of credits: 6

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: test
Exam: exam
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
After completing the course the student will master the most important concepts, results of the method of linear algebra and geometry and will be able to actively use them in other mathematical disciplines and in various fields of physics.

Class syllabus:
Bilinear and quadratic forms, scalar product, Euclidean and unitary spaces, Minkowski spacetime, eigenvalues and eigenvectors, linear operator spectrum, Jordan canonical form, self-adjoint and unitary operators, spectral decomposition, principal axis theorem, quadrics.

Recommended literature:
Linear Algebra and Geometry: A Journey of Three Dimensions with Overlaps in Related Fields / Pavol Zlatoš. Bratislava: Albert Marenčin, 2011; electronic version available at http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf
We grow linear algebra / Luboš Motl, Miloš Zahradník. Prague: Karolinum, 2002

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 278

A	B	C	D	E	FX
19,42	22,3	19,42	23,02	12,95	2,88

Lecturers: prof. RNDr. Pavol Zlatoš, PhD., Mgr. Nina Hronkovičová

Last change: 09.03.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-910/22	BSc Project

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

Number of credits: 4

Recommended semester: 5.

Educational level: I.

Prerequisites:

Recommended prerequisites:
none

Course requirements:
Active individual work
Scale of assessment (preliminary/final): Scale of assessment (preliminary/final): continuous assessment 100% :homeworks, individual work.

Learning outcomes:
Preparation of bachelor Thesis, study of relevant literature and methods

Class syllabus:
Individual work under the leadership of superviser.

Recommended literature:
Given by supervisor and bachelor prpoject

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 9

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

Lecturers: prof. Dr. Štefan Matejčík, DrSc.

Last change: 17.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-TEF-991/19	**Course title:** BSc Thesis Defense
Number of credits: 8	
Recommended semester: 5., 6..	
Educational level: I.	
Course requirements: Exam: oral Scale of assessment (preliminary/final): 0/100	
Learning outcomes: The result of successful completion of the state subject will be the defense of the BSc thesis.	
State exam syllabus:	
Languages necessary to complete the course: Slovak, English	
Last change: 08.03.2022	
Approved by: prof. Dr. Štefan Matejčík, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-303/25	Basic Electrical Engineering (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: 4

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

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

Lecturers: doc. RNDr. Michal Maheľ, CSc., doc. RNDr. František Kundracik, CSc., Ing. Pavol Ďurina, PhD., doc. Ing. Maroš Gregor, PhD.

Last change: 26.05.2025

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-304/25	Basic Electrical Engineering (2)

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

Number of credits: 4

Recommended semester: 6.

Educational level: I.

Prerequisites: FMFI.KEF/1-TEF-303/25 - Basic Electrical Engineering (1)

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

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

Lecturers: doc. RNDr. Michal Maheľ, CSc., doc. RNDr. František Kundracik, CSc., Ing. Pavol Ďurina, PhD., doc. Ing. Maroš Gregor, PhD.

Last change: 26.05.2025

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/2-FOL-116/15	Basic Electronics

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

Number of credits: 7

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:
Continuous assessment: work on practical exercises (100%). The condition for granting credits is the presentation of a semester project.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will understand the principles of using basic building blocks (resistor, inductance, capacitance, diode, transistor) in digital and analog circuits. They will understand the principles and use of basic digital and analog circuits (gates, counters, timers, operational amplifier, A / D and D / A converters, Arduino microprocessor system), principles of generating harmonic and non-harmonic signals and linear and pulse power supplies. They will be able to analyze basic circuits and use them to design simple electronic circuits with the required functionality. He will also gain practical experience with the construction and revitalization of simple electronic circuits.

Class syllabus:
Semiconductor diode and transistor and their basic connections. Transistor in switching mode, TTL digital circuits and their use. Basic logic circuits. Comparator. Timer 555. D / A and A / D converters. Arduino microprocessor system. Nodal potential method. Analysis of linear circuits in time and frequency domain. Linear model of transistor and operational amplifier. Basic circuits with operational amplifier. Positive feedback and oscillator principles. Power supplies and rectifiers.

Recommended literature:
The art of electronics / Paul Horowitz, Winfield Hill. New York : Cambridge University Press, 1989

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 132

A	B	C	D	E	FX
96,21	0,0	3,03	0,0	0,0	0,76

Lecturers: doc. RNDr. František Kundracik, CSc., doc. RNDr. Matej Klas, PhD., doc. RNDr. Juraj Országh, PhD.

Last change: 27.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 235					
A	B	C	D	E	FX
50,64	15,32	13,19	9,79	2,98	8,09
Lecturers: RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD.					
Last change: 04.07.2022					
Approved by: prof. Dr. Štefan Matejčík, DrSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-111/19	CAD Technical Drawing

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: 4

Recommended semester: 2.

Educational level: I.

Prerequisites:

Course requirements:
Exam weight in rating: 0%
It is necessary to obtain at least 90% of points to obtain A grade, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Graduates will have developed skills needed in the creation of technical documents such as drawings, technical tables, parts lists, etc. The aim of the course is to acquaint students with the terminology of technical drawing, general principles of designing parts and structures, to the creation of production drawings using AutoCAD software.

Class syllabus:
Standardization in technical drawing, display of parts - display techniques on mechanical, electrical and construction drawings, dimensions, sections and geometric tolerances, surface roughness, standardized parts, production drawings, AutoCAD software - basics of drawing in CAD systems.

Recommended literature:

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 20

A	B	C	D	E	FX
65,0	15,0	5,0	0,0	0,0	15,0

Lecturers: doc. Ing. Maroš Gregor, PhD.

Last change: 27.01.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 223					
A	B	C	D	E	FX
19,73	15,7	16,14	17,94	14,35	16,14
Lecturers: doc. Mgr. Richard Kollár, PhD., Mgr. Jakub Poljovka					
Last change: 24.06.2022					
Approved by: prof. Dr. Štefan Matejčík, DrSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

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: 155					
A	B	C	D	E	FX
15,48	13,55	10,32	16,13	25,81	18,71
Lecturers: doc. Mgr. Richard Kollár, PhD.					
Last change: 24.06.2022					
Approved by: prof. Dr. Štefan Matejčík, DrSc.					

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-FYZ-871/20	Chemical Physics

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

Number of credits: 7

Recommended semester: 6.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: homework
Exam: oral
The evaluation of the subject takes place in the form of continuous (individual work) and final evaluation (oral exam). Successful completion of the course reflects the student's sufficient orientation in the issue. The course will be graded as provided the student demonstrates compliance with at least 51%. The conditions for successful completion of the course are in accordance with the Study Regulations of FMFI UK
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 51%
Scale of assessment (preliminary/final): Weight of the intermediate / final evaluation: 30/70

Learning outcomes:
Understand the importance of quantum mechanical description of substances at the molecular level - the basis of theoretical approaches to the study of their reactions.
Subject of interest - quantum mechanical description of molecules and their aggregates. To master the practical tasks of solving the electron shell of molecules using current methods of quantum chemistry.

Class syllabus:
Standard molecular Hamiltonian. Atomic system of units. Born - Oppenheimer approximation. Potential energy surface (curve). Solution of the electron Schrodinger equation MO-LCAO approximation. Electron repulsion - model of independent particles. Huckel approximation, Hartré approximation, Hartree-Fock approximation, Coulomb and exchange integral.Practical applications for solving the structure of molecules.
Nuclear Schrodinger equation, its solution for diatomic molecules. Model rigid rotor-harmonic oscillator, separation of vibrational and rotational motion fault processing of their interaction. Practical demonstration - calculation of spectroscopic constants of a selected diatomic molecule. Rotation of polyatomic molecules, rotational levels, rotational constants. Vibrations of polyatomic molecules - vibrational levels, normal modes.
Symmetry of molecular systems. Dynamic aspects of molecular systems. Transit state methods, collision theory, quasiclassical trajectory method.Environmental influence - methods of solvation

description. Methods considering dielectric continuum and non-methods considering discrete solvent.

Recommended literature:
Atkins P, Friedman R (2005) Molecular Quantum Mechanics Fourth Edition
Szabo A, Ostlund NS Modern Quantum Chemistry

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

Notes:

Past grade distribution
Total number of evaluated students: 26

A	B	C	D	E	FX
50,0	19,23	15,38	7,69	7,69	0,0

Lecturers: doc. RNDr. Peter Papp, PhD., Mgr. Ivan Sukuba, PhD., RNDr. Ing. Milan Melicherčík, PhD.

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 94

A	B	C	D	E	FX
64,89	12,77	9,57	1,06	0,0	11,7

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-232/22	Computational Physics

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: 4

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: elaboration of homework for individual lectures.
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate of the course will acquire the skills necessary for the numerical solution of simple physical problems and will learn the basic algorithms of numerical calculations and their programming in a programming language (C ++, Python, ...)..

Class syllabus:
Numerical stability of simple iteration schemes. Transition from a continuous problem to a discrete one. Numerical solution of the wave equation. Nonlinear iteration schemes. Numerical calculation of integrals. Random numbers. Differential equations: Runge-Kutta methods. Systems of differential equations. Simple physical models, firing method, time evolution of nonlinear physical models, Brownian motion. Simple integral equation, Optimization.

Recommended literature:
W. H. Press et al..: Numerical Recipes. Cambridge Univ. Press, 1992

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 262

A	B	C	D	E	FX
57,25	9,54	7,63	6,11	8,02	11,45

Lecturers: doc. RNDr. Peter Papp, PhD., doc. Mgr. Jozef Kristek, DrSc.

Last change: 17.05.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-204/22	Electricity and Magnetism

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: 8

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Continuous classification: home works, written tests.
Exam: written and spoken.
Weight of exam in overall classification: 50%.
Grading scale: A 90%, B 80%, C 70 %, D 60 %, E 50%.
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The student will understand principles of electric and magnetic phenomena and the laws describing them. He/she will be able to calculate topology of electric and magnetic fields in rather simple situations, calculate properties of components based on application of electric and magnetic fields, including electric circuits. He/she will understand relationship between electric and magnetic fields, electromagnetic induction, and Maxwell's equations.

Class syllabus:
Electric charge, electric field, Coulomb's and Gauss's laws, electric potential, Poisson's and Laplace's equation, electric fields around conductors, capacity. Dipole model of dielectrics, electric fields and Gauss's law in dielectrics. Electric current, continuity equation, Kirchoff's laws. Magnetic field, Biot-Savart law, Ampère's law, displacement current, electromagnetic induction. Dipole model of magnetic materials, ferromagnetic materials, Ampère law in magnetic materials. Relativistic relation of electric and magnetic field. Maxwell's equations.

Recommended literature:
Electricity and Magnetism / Edward M. Purcell and David J. Morin, 3rd edition, Cambridge University Press, 2013.
The Feynman Lectures on Physics 2 / Richard P. Feynman, Robert B. Leighton, Matthew Sands, California Institute of Technology, 1964.
Fundamentals of Physics 12th edition / David Halliday, Robert Resnick, Jearl Walker, Wiley, 2021.

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 12

A	B	C	D	E	FX
25,0	25,0	0,0	16,67	25,0	8,33

Lecturers: prof. Dr. Štefan Matejčík, DrSc., Mgr. Michal Stano, PhD.

Last change: 25.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-302/19	Electronics

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

Number of credits: 5

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous: Homework, 20%
Final: Project, 80%
The course will be classified provided that the student proves the fulfilment of obligations at the level of at least 51 %. The conditions for successful completion of the course are in accordance with the Study Regulations of the Faculty of Mathematics, Physics and Informatics.
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Students acquire essential knowledge on principles of electronic devices, circuit analysis, signal processing, and external process control. They acquire skills on electronic circuitry design by means of simulation software, and PCB layout automation as well.

Class syllabus:
Basic physical properties of p-n junction and Shottky-junction. Diodes – review of performance and applications. Transistors – review of performance, basic circuits and applications. Thyristors – review of performance, basic circuits and applications. OpAmps – basic circuits. Passive and active RLC circuits. Electronic sensors of physical quantities. Power and impedance matching. Basic control techniques (P, PI, PD, PID). Essentials of signal modulation. Software circuit simulation and PCB layout automation (KiCad).

Recommended literature:
The Art of Electronics/P. Horowitz, P. Hill, Cambridge University Press, ISBN 978-0-521-37095-0
Physics of Semiconductor Devices/S. M. Sze, K. Ng, Wiley-Interscience (2006)
KiCad Complete reference manual, ISBN:978-1-68092-127-4

Languages necessary to complete the course:
Slovak in combination with English (suggested readings in English)

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
90,91	0,0	0,0	0,0	0,0	9,09

Lecturers: doc. RNDr. Michal Maheľ, CSc., doc. RNDr. František Kundracik, CSc.

Last change: 20.01.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 291

A	B	C	D	E	FX
75,26	9,62	4,81	1,37	1,03	7,9

Lecturers: Mgr. Aneta Barnes

Last change: 11.04.2024
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
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: 7132

A	B	C	D	E	FX
29,54	23,11	18,17	12,56	7,84	8,78

Lecturers: Mgr. Eva Foltánová, Mgr. Ing. Jana Kočvarová, Mgr. Ľubomíra Kožehubová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.
Last change: 20.06.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
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: 1422

A	B	C	D	E	FX
15,47	19,06	22,78	18,35	18,0	6,33

Lecturers: PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.
The textbook has not been published. It is at students' disposal in an electronic format.
Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.
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: 4292

A	B	C	D	E	FX
25,19	28,1	21,6	11,84	6,06	7,22

Lecturers: Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Dobiašová, PhD.

Last change: 17.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/1-FYZ-118/16	Exercises from Mechanics (1)

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

Number of credits: 2

Recommended semester: 3.

Educational level: I.

Prerequisites:

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

Learning outcomes:
Mechanics

Class syllabus:
Additional exercise for the subject Mechanics (1). We will practice more simple examples of this subject.

Recommended literature:
Physics part 1: Mechanics / D. Halliday, R. Resnick, J. Walker / VÚT in Brno, 2003
Physics I. / Dionýz Ilkovič / Bratislava, Alfa, 1972
Feynman lectures in physics 1 / R.P. Feynman, R.B. Leighton, M. Sands / Nakladatelsví Fragment, 2013
Electronic texts of the presentation on the website of the subject Mechanics (1)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 272

A	B	C	D	E	FX
31,99	21,32	18,75	13,97	5,51	8,46

Lecturers: Mgr. Peter Maták, PhD.

Last change: 09.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/1-FYZ-119/16	Exercises from Mechanics (2)

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

Number of credits: 2

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: papers
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Weight of the intermediate / final evaluation: 100/0
Scale of assessment (preliminary/final): Continuous assessment: papersIndicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%Weight of the intermediate / final evaluation: 100/0

Learning outcomes:
Mechanics.

Class syllabus:
Additional exercise for the subject Mechanics (2). We will practice more simple examples of this subject.

Recommended literature:
Physics part 2: Mechanics / D. Halliday, R. Resnick, J. Walker / Brno University of Technology, 2003
Physics I. / Dionýz Ilkovič / Bratislava, Alfa, 1972
Feynman lectures in physics 1 / R.P. Feynman, R.B. Leighton, M. Sands / Nakladatelsví Fragment, 2013
Electronic texts of the presentation on the website of the subject Mechanics (2)

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 209

A	B	C	D	E	FX
40,67	22,49	17,22	11,48	2,87	5,26

Lecturers: Mgr. Peter Maták, PhD.

Last change: 09.03.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 482

A	B	C	D	E	FX
48,76	19,09	17,01	8,09	2,07	4,98

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 120

A	B	C	D	E	FX
45,83	25,83	18,33	5,83	0,83	3,33

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 828

A	B	C	D	E	FX
37,56	25,48	18,6	9,18	2,78	6,4

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

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 541

A	B	C	D	E	FX
37,89	19,59	19,59	12,38	3,51	7,02

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

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 184

A	B	C	D	E	FX
44,02	23,91	20,11	6,52	2,17	3,26

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

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 105

A	B	C	D	E	FX
74,29	20,0	3,81	0,0	0,0	1,9

Lecturers: Mgr. Ľudmila Hlinová

Last change: 15.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-451/15	Introduction to Plasma Physics and Electrical Discharges

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: 6.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: no
Final: test, exam
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
In the course, students will gain basic knowledge of plasma physics and electrical discharges, which are necessary for successful completion of the bachelor's thesis in the area. After completing the course, students will be able to easily orient themselves in the studied issues, as they will have basic knowledge about plasma, its occurrence, generation methods, mechanisms of electric discharges, their application and plasma diagnostics. Upon successful completion of the course, students will be knowledge-ready for a possible master's degree in Plasma Physics.

Class syllabus:
1. Plasma - 4th state of matter, natural occurrence of plasma, "quasineutrality" of ionized gas, methods of plasma generation (various types of electric discharges in gases), application of glow, corona and arc discharges.
2. Debye-Hückel theory of charge shielding: collective phenomena of particles, plasma polarization, shielding of el. field of inserted charge, shielded potential, Debye length, Debye sphere - ideal, non-ideal plasma.
3. Plasma charge fluctuation, quasi-neutrality of plasma, exact definition of plasma; plasma oscillations, plasma frequency.
4. Elastic and inelastic collisions of particles in plasma, mean free path of gas particles, collision frequency, effective collision cross section, reaction coefficient, elementary processes in plasma.
5. Excitation and ionization by electron-ion interaction, differential ionization, particle ionization collision cross section; radiation ionization and excitation, resonant radiation, diffusion of radiation, radiation absorption, effective photon collision cross section; thermal ionization and excitation, degree of ionization, Saha equation, binary gas, degree of excitation and Boltzmann's law.
6. Dissociative ionization, Townsend (first) ionization coefficient, ionization function, Wannier equation; negative ion formation, electron affinity, electronegative and electropositive gases,

dissociative attachment, three-particles attachment, transient negative ion (TNI); reaction coefficient, reduced el. field.
7. Particle recombination - spatial, on electrodes, on the wall (conductive, non-conductive); negative ion extinction; spatial recombination, recombination factor of electrons with positive ions.
8. The movement of particles in el. field (drift), charged particle mobility, drift velocity; particle motion under the influence of concentration gradient (diffusion), Fick's law, Einstein's relation; Ambipolar diffusion.
9. Statistical theory of el. discharges, statistical model of electron avalanches, statistical model of el. discharges.
10. Streamer concept, Boltzman kinetic equation and Monte Carlo method.
11. El. Discharges at high pressure, corona discharge, corona discharge in applied electrostatics, primary and secondary streamer.
12. Dielectric barrier discharges, glow discharges at atmospheric pressure, surface activations of polymeric materials in various types of el. discharges.
13. Spark and arc discharge, el. discharges in liquids.
14. Plasma diagnostics, single and double probe (determination of electron concentration and temperature), optical emission spectroscopy, atomic spectra (determination of electron temperature from the ratio of intensity of spectral lines), molecular spectra (determination of rotational temperature spectra), actinometry, laser absorption spectroscopy, corpuscular spectroscopy, CRDS spectroscopy.
15. Examples of plasma application use: in metallurgy, in surface treatment of materials, environmental protection, light sources, thermonuclear fusion.
During the practical part of subject, computational tasks on the topic will be solved and additional (time-consuming) mathematical definitions of some physical relations and laws of lectures will be performed. Students will gain and acquire knowledge of the basics of modeling in plasma physics, and within the demonstration experiments of individual electric discharges, they will actually get acquainted with the instrumentation of laboratories. They will also get acquainted with diagnostic methods used in plasma physics - optical emission spectroscopy, probe methods, microwave methods, mass spectroscopy.

Recommended literature:
Základy fyziky plazmy : Učebný text pre magisterské štúdium / Viktor Martišovitš. Bratislava:Univerzita Komenského, 2006
Fundamentals of plasma physics / J. A. Bittencourt. New York: Springer, 2004
Basic plasma physics: Selected chapters. Handbook of plasma physics. Volumes 1 and 2 / editorsA. A. Galeev, R. N. Sudan. Amsterdam: North-Holland, 1989

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 40

A	B	C	D	E	FX
50,0	30,0	10,0	10,0	0,0	0,0

Lecturers: doc. Mgr. Dušan Kováčik, PhD., doc. RNDr. Mário Janda, PhD.

Last change: 09.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-452/22	Introduction to Solid State Physics

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: 6.

Educational level: I., II.

Prerequisites:

Antirequisites: FMFI.KEF/1-FYZ-452/18

Course requirements:
Continuous assessment: homework, 2 papers
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): Weight of the intermediate / final evaluation: 100/0

Learning outcomes:
After completing the course, students will be actively acquainted with the following basic concepts of solid state physics: ideal crystal, reciprocal space, phonon spectrum, electron band structure and Fermi surface. They will also know how these concepts enter into the simplest analyzes of the thermal, electrical and optical properties of solids.

Class syllabus:
Symmetry classification of substances. Van der Waals-London bond. Liquid-gas transition. Crystals with van der Waals and ionic bonding. Basics of crystallography. Surface tension and nucleation. Diffraction experiments and reciprocal space. Classical and quantum lattice oscillations theory. Metal binding. Chemical bonding. Electron spectrum in an ideal crystal: tight bond method, Bloch's theorem, difference between metals and insulators. Transport phenomena: phenomenological description, Boltzmann's equation. Semiconductors and semiconductor electronics. Response to time-varying fields. Elementary models of dielectric function.

Recommended literature:
http://www.st.fmph.uniba.sk/~hlubina1/
Condensed matter physics : Corrected printing / Michael P. Marder. John Wiley, 2000
Solid-State Physics / H. Ibach, H. Lüth. Springer, 2003
Úvod do fyziky pevných látek / Charles Kittel. Academia, 1985

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 15

A	B	C	D	E	FX
46,67	13,33	6,67	0,0	26,67	6,67

Lecturers: doc. RNDr. Richard Hlubina, DrSc., Mgr. František Herman, PhD.

Last change: 24.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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
37,21	23,84	15,12	11,05	5,23	7,56

Lecturers: doc. PhDr. Ján Rybár, PhD.

Last change: 17.05.2024
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-311/22	Materials science

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:

Course requirements:
Exam: written
Exam weight in rating: 0%
It is necessary to obtain at least 90% of points to obtain A grade, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E.

Learning outcomes:
The student will gain knowledge in the field of preparation, structure, and properties of technical materials. In the introductory part of the course, they will get acquainted with amorphous/crystalline materials, with point defects in materials, dislocations and surface defects, their influence on mechanical properties. It will also focus on phase transformations in solid solutions, steels, and non-ferrous alloys, on heat treatment methods and its influence on mechanical properties. The student will get a comprehensive idea of material fatigue, of material creep. They will also learn basic information about structural ceramics and thin ceramic films and how to prepare them and their properties.

Class syllabus:
Basic construction of materials, defects in lattices, dislocation mechanisms. Deformation mechanisms, strengthening. Tensile test, Surface defects, Grain boundaries. Solid solutions, Phase transformations in solid solutions. Steels, and their alloying. Peritectic, monotectic, eutectic, eutectoid transformations. IRA, ARA diagrams, martensitic transformation. Precipitation, spinodal decomposition in Al alloys. Structural ceramics - oxides, carbides, borides, powder metallurgy, thin films, creep, fracture mechanics, material fatigue.

Recommended literature:
Náuka o materiáloch I/ R. Moravčík a kol. MTF STU, 2010
Úvod do materiálového inžinierstva I/ R. Moravčík a kol. MTF STU, 2015

Languages necessary to complete the course:
Slovak in combination with English (suggested readings in English)

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
50,0	20,0	10,0	10,0	10,0	0,0

Lecturers: doc. Ing. Marián Mikula, PhD.

Last change: 25.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-116/22	Mathematical Methods in Physics (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:

Antirequisites: FMFI.KJFB/1-FYZ-116/15

Course requirements:
For the semester, the student can get 30% (for tests) and the final written exam has a weight of 50%. The student must obtain at least half a point per semester in order to pass the final written exam. Indicative scale: 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 completing the course, students will be able to use advanced mathematical methods necessary to master physics courses. In particular, methods of differential and integral calculus.

Class syllabus:
Scalars and vectors, operations of their use in physics. Linear algebra (solving equations with several variables, linear independence, determinants, matrices). Complex numbers and their use. Limits and derivatives (physical, geometric meaning, rules for calculation, use of derivatives in mathematics and physics - velocity, acceleration, differential, extrema). Integrals (methods of integration - modifications, per partes, substitution). Applications of integrals in physical practice, the principle of superposition (calculation of centers of gravity, moments of inertia, potentials of conservative fields, forces acting between bodies of different shapes). Numerical methods of derivation and integration. Council (Taylor and Mac Laurinov, Fourier work). Differential equations as a basic language of physics (separable DR, homogeneous DR, DR order reduction method, linear DR of the first and second degree, method of variation of constants, method of indeterminate coefficients, method of compiling DR and their use in physics). DR solutions that cannot be solved explicitly (qualitative method, development into a series, numerical method of LDR solution).

Recommended literature:
Matematika pre fyzikov / A. Grega, D. Kluvanec, E. Rajčan. Bratislava : Slovenské pedagogické nakladateľstvo, 1974
Matematický aparát fyziky / Jozef Kvasnica. Praha : Academia, 1997

Matematické metody ve fyzice a technice / John Warren Dettman ; přeložil Jiří Langer ; vedec. red. Miroslav Brdička. Praha : Academia, 1970

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 373

A	B	C	D	E	FX
20,11	11,8	16,89	16,89	21,18	13,14

Lecturers: doc. RNDr. Radoslav Böhm, PhD., prof. RNDr. Fedor Šimkovic, CSc.

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-117/22	Mathematical Methods in Physics (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:

Antirequisites: FMFI.KJFB/1-FYZ-117/15

Course requirements:
For the semester, the student can get 30% (for tests) and the final written exam has a weight of 50%. The student must obtain at least half a point per semester in order to pass the final written exam. Indicative scale: 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 completing the course, students will be able to use advanced mathematical methods necessary to master physics courses. They will be skilled in the use of numerical methods and able to process the measured experimental data.

Class syllabus:
Multiple variable functions. Multidimensional integrals and their use in physics (integration over the "rectangle", integration over the set, substitution method - transformation of the integral into different coordinate systems, calculation of the moment of inertia, calculation of the position of the center of gravity). Vector scalar argument function. Coordinate systems (polar, cylindrical, spherical - volume and area elements, speed determination, accelerations in various bases). Tensors (motivation for the introduction of the tensor - the relationship between the momentum and angular velocity in rotational motion, the moment of inertia tensor and its components, the search for the main axes of the inertia tensor). Curve integrals and their use in physics (curve integrals of the 1st and 2nd kind - work, center of gravity, conservative and non-conservative fields - without criteria). Fundamentals of vector analysis (directional derivation, gradient of scalar function and its Einstein summation convention, Laplace operator in various coordinate systems, rotation and divergence of vector function - creation of "idea" based on analogy with hydrodynamics. Gauss-Ostrogradsky theorem, Stokes theorem and its application Field conservation criteria, area calculation). Fundamentals of statistics (Random variables - discrete and continuous, probability density, Gaussian distribution, calculation of means, standard deviation, applications in physics,

data processing elements, arithmetic mean error, data fitting, minimization of the sum of squares). Partial DR and their use in physics (wave equation, methods of solving partial DR) Numerical methods for solving partial DR.

Recommended literature:

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 295

A	B	C	D	E	FX
23,73	14,58	19,66	17,29	17,29	7,46

Lecturers: doc. RNDr. Radoslav Böhm, PhD., prof. RNDr. Fedor Šimkovic, CSc.

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/1-TEF-202/19	Mathematics (3) - Differential Equations, Special Functions

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:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
18,18	9,09	9,09	45,45	18,18	0,0

Lecturers: doc. RNDr. Pavel Chalmovianský, PhD., Mgr. Ľudovít Balko, PhD.

Last change: 01.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-TEF-203/20	Mathematics (4) - 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.

Prerequisites:

Antirequisites: FMFI.KAMŠ/1-TEF-203/19

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 9

A	B	C	D	E	FX
33,33	0,0	22,22	11,11	33,33	0,0

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

Last change: 02.10.2021

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-111/15	Mechanics (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:
Assesment during the semester: homeworks, written tests
Final exam: written test and oral exam
Approximate scale of final grades: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
Elementary knowledge of physics methodology, understanding the role of equation of motions, ability to solve simple equations of motion, simple numerical methods which can be used if analytical solution is not possible, orientation in basic terminology of mechanics like mass, energy, momentum, moment of inertia, frequency etc.

Class syllabus:
Physical quantities and units
Kinematics of point-like objects, velocity, acceleration
Vector quantities, centripetal acceleration
Motion with constant acceleration
Motion in constant gravitational field, projectile motion, energy conservation law
Newton laws of mechanics
Law of inertial movement, inertial frame of reference, uniform straight line motion
law of force, numerical solution for ballistic curve
Fundamentals of physics methodology, state of a system, change of state, equation of motion
Rotation, angular velocity
momentum of a system of point objects, conservation law
angular momentum, conservation law
tensor of inertia, Newton laws for simple rotational movements
static friction, dynamic friction
equilibrium conditions
scalar product, work of arbitrary force
Newton gravitation law, gravitation potential, energy conservation
Kepler laws

Circular motion in gravitation field
Harmonic oscillator
Hooks law for spring
Damped harmonic oscillator, resonance effect, lifetime/frequency uncertainty principle
Mathematical and physical pendulum

Recommended literature:
Halliday, Resnick, Walker: Fundamentals of physics
Feynman lectures on physics

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 414

A	B	C	D	E	FX
17,15	11,35	9,66	7,73	21,01	33,09

Lecturers: doc. RNDr. Martin Mojžiš, PhD., Mgr. Peter Maták, PhD.

Last change: 11.04.2017

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KTF/1-FYZ-112/15	Mechanics (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:

Course requirements:
Priebežné hodnotenie: domáce úlohy, písomka
Skúška: písomná a ústna
Orientačná stupnica hodnotenia: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Ability to work with physical systems with an infinite number of degrees of freedom, to understand the solution of a partial differential equation as an equation of motion, knowledge of basic concepts of hydromechanics, knowledge of basic concepts of molecular mechanics and thermodynamics, knowledge of thermodynamics applications in ideal classical gas, basic probability theory mathematical statistics in physics, understanding the basics of the theory of relativity

Class syllabus:
Elements of elasticity theory on the example of prism deformations, pressure and shear stress, Young's modulus.
Movement of coupled oscillators.
Chain of bound oscillators, continuous limit.
Wave equation and its solution, normal modes, Fourier decomposition.
Elastic waves in the continuum, sound, Doppler principle
Fluids, Pascal's law
Archimedes' law, Statics of fluids
Ideal fluid motion, Continuity equation, Bernoulli's equation
Calorimetry of incompressible fluid, the problem of what heat is.
Basic phenomenology of capillary and osmotic phenomena
History of the discovery of molecules by chemists.
Mol, Avogadro's constant, typical dimensions of the microworld
Phenomenology of gas processes, equation of state, Kelvin scale
Kinetic theory of gas pressure, energy temperature relation

Macroscopic work of gas, heat as microscopic work, first law of thermodynamic
Mayer's relation, Adiabatic process
Data processing elements, arithmetic mean error
Data fitting, minimizing sum of squares, (chi-square distribution?).
Drunken sailor, related to fluctuations
Maxwell's velocity distribution
Boltzmann distribution and barometric formula
Elements of relativity theory

Recommended literature:

Physics part 1. Mechanics: University textbook of general physics / David Halliday, Robert Resnick, Jearl Walker; translated by Jana Musilová ... [et al.]. Brno: VUTIUM Technical University, 2000

Physics part 2. Mechanics - thermodynamics: University textbook of general physics / David Halliday, Robert Resnick, Jearl Walker; translated by Jan Obdržálek ... [et al.]. Brno: VUTIUM Technical University, 2000

General physics: 1: mechanics and molecular physics / Štefan Veis, Ján Maďar, Viktor Martišovitš. Bratislava: Alfa, 1978

Physics for students at technical universities: 1: mechanics, acoustics, thermals / Dionýz Ilkovič. Bratislava: Alfa, 1972

Electronic texts and presentations on the subject's website

Languages necessary to complete the course:

Notes:

Past grade distribution

Total number of evaluated students: 286

A	B	C	D	E	FX
30,77	18,18	13,99	10,84	16,08	10,14

Lecturers: doc. RNDr. Martin Mojžiš, PhD., Mgr. Peter Maták, PhD.

Last change: 18.05.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/1-TEF-201/20	Mechanics (3)

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

Number of credits: 5

Recommended semester: 5.

Educational level: I.

Prerequisites:

Antirequisites: FMFI.KAMŠ/1-TEF-201/19

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 7

A	B	C	D	E	FX
42,86	42,86	14,29	0,0	0,0	0,0

Lecturers: doc. RNDr. Peter Guba, PhD., doc. RNDr. Sebastián Ševčík, CSc.

Last change: 01.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-206/22	Modern Physics

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: 8

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: papers
Exam: written
Exam weight in rating: 64%
It is necessary to obtain at least 90% of points to obtain A grade, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E.
Scale of assessment (preliminary/final): 36/64

Learning outcomes:
After completing the course, students will understand the difference between classical and quantum description of the world, they will get acquainted with the basic experiments that led to the emergence of quantum mechanics. They will understand the physical principles of simple quantum systems and will be able to solve the basic problems of quantum physics.

Class syllabus:
Experiments leading to quantum mechanics: black body radiation, photoelectric effect, atomic spectra. Discovery of the atomic nucleus. Basic quantum problems: particle in potential, tunneling, harmonic oscillator and their use in the description of quantum systems: spectrum of atoms, molecules. Fermions and bosons. Quantum nature of important physical phenomena: electrical conductivity, laser, properties of solids, superconductivity. Elementary models of the atomic nucleus.

Recommended literature:

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
9,09	27,27	9,09	27,27	18,18	9,09

Lecturers: Mgr. Pavol Neilinger, PhD., prof. RNDr. Miroslav Grajcar, DrSc.

Last change: 25.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-205/22	Optics

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: 8

Recommended semester: 4.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: homework, papers
Exam: test and oral exam
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Upon completion, the student will understand the basic principles of optics, optical imaging, the nature of operation of simple optical instruments, will master the principles of interference and diffraction of light, propagation and generation of radiation and polarization of light. The student will have a basic overview of optical spectroscopy and nonlinear optics.

Class syllabus:
Electromagnetic field in vacuum (Follow-up to the previous lecture by Elmag., Overview of Maxwell's equations, polarization, definition of quantities characterizing light); Basic principles (quarry, Fermat's principle, Snell's law); Limit cases of light propagation (wave optics, geometric optics, definitions, differences); Geometric optics (paraxial approximation, matrix formalism, simple imaging systems); Wave optics - interference (Young's experiment, Michelson interferometer, radiation coherence, ...); Wave optics - diffraction (Huyghens principle, Fresnel diffraction, Fraunhofer diffraction, ...); Light propagation and generation (dielectric, metals, anisotropic environment, interaction of light with matter - absorption, emission, scattering); Spectroscopy (basics, dispersive, interference spectrometers); Photonics and nonlinear optics (basics).

Recommended literature:

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
18,18	27,27	27,27	18,18	9,09	0,0

Lecturers: doc. Mgr. Peter Čermák, PhD.

Last change: 25.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 201

A	B	C	D	E	FX
89,55	1,49	1,49	0,0	2,99	4,48

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 201

A	B	C	D	E	FX
89,55	1,49	1,49	0,0	2,99	4,48

Lecturers: Mgr. Xenia Daniela Poslon, PhD.

Last change: 06.09.2023

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB+KEF/2-FBF-102/00	Physical Chemistry and Electrochemistry

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., I.II., II.

Prerequisites:

Course requirements:
Continuous assessment: homework
Exam: oral
The evaluation of the subject takes place in the form of continuous (individual work -20% of total score) and final evaluation (oral exam). Successful completion of the course reflects the student's sufficient orientation in the issue. The course will be graded as provided the student demonstrates compliance with at least 51%. The conditions for successful completion of the course are in accordance with the Study Regulations of FMFI UK
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
The student will have developed a basic apparatus for understanding the physical nature of chemical processes, which may be encountered in other subjects (biochemistry, bioenergetics, plasma physics) as well as with the principles of some analytical methods used e.g. in biophysics.

Class syllabus:
Thermochemistry, creative, reaction and bond enthalpies, their use. Fundamentals of chemical thermodynamics, chemical potential and its application to the study of equilibrium processes. Fugacity, fugacity coefficient, activity, activity coefficient. Chemical equilibrium, equilibrium constant and its dependence on state variables. Affinity of a chemical reaction, conditions of spontaneous chemical course. reactions. Acid-base reactions and the theory of acids and bases. Galvanic cell, electrode potential, its use for measuring physico-chemical quantities. Introduction to chemical kinetics. Reaction order, methods of determining the reaction order. Reaction mechanisms and their relation to the kinetic equation. Homogeneous and heterogeneous catalysis. Autocatalysis, oscillating reactions.

Recommended literature:
http://www.chem1.com/acad/webtext/virtualtextbook.html

Languages necessary to complete the course:

english

Notes:

Past grade distribution
Total number of evaluated students: 115

A	B	C	D	E	FX
61,74	29,57	4,35	0,0	0,0	4,35

Lecturers: Mgr. Petra Šrámková, PhD., doc. RNDr. Peter Papp, PhD.

Last change: 18.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 7053

A	B	C	D	E	FX
93,31	1,6	0,21	0,0	0,07	4,81

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

Last change: 16.06.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 5840

A	B	C	D	E	FX
95,6	1,51	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
Last change: 15.03.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 3268

A	B	C	D	E	FX
98,29	0,46	0,09	0,03	0,0	1,13

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

Last change: 16.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 2956

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

Last change: 15.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 2172

A	B	C	D	E	FX
98,66	0,37	0,09	0,0	0,0	0,87

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

Last change: 15.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 204

A	B	C	D	E	FX
94,61	0,49	0,49	0,0	0,0	4,41

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

Last change: 15.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/1-FYZ-322/22	Practical in atomic and nuclear physics

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

Number of credits: 3

Recommended semester: 6.

Educational level: I., I.II.

Prerequisites:

Recommended prerequisites:
1-FYZ-231/22 Introduction to Modern Physics (Physics 2/S)

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

Learning outcomes:
Gain experimental skills with used instrumentation, registration of ionizing radiation and processing of measured data. In the realized experiments, make sure of the agreement of experiments and theories that clarify them.

Class syllabus:
In the introductory exercise, students will get acquainted with the methods used to process electrical pulses from ionizing radiation detectors (differential discriminator, single-channel and multi-channel analyzer). Separate laboratory exercises follow
- from atomic physics: Franck-Hertz experiment (verification of Bohr's postulates), Stefan-Boltzmann's law (radiation of an absolutely black body), range of alpha particles in air (principles of semiconductor detectors)
- from nuclear physics: statistical nature of nuclear transformations, determination of gamma radiation energy (principles of scintillation detectors), verification of Compton scattering
- from applied nuclear physics: measurement of air radioactivity (principles of Geiger-Müller detectors).

Recommended literature:
- instructions for exercises at http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm
- Physics practicum IV: Atomic physics and ionizing radiation detection / Matej Florek ... [et al.]. Bratislava: Comenius University, 1988

Languages necessary to complete the course:
Slovak, English.

Notes:
Recommended range of instruction (in hours): 39
Weekly: 2P + 1H Period of study: 27 P (9 weeks x3h) +12 H (4 weeks x3h)

Past grade distribution
Total number of evaluated students: 37

A	B	C	D	E	FX
83,78	10,81	0,0	0,0	5,41	0,0

Lecturers: doc. RNDr. Monika Müllerová, PhD., doc. RNDr. Miroslav Ješkovský, PhD., RNDr. Miroslav Pikna, PhD.

Last change: 24.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-222/22	Practical in electricity and magnetism

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

Number of credits: 3

Recommended semester: 4.

Educational level: I., I.II.

Prerequisites: FMFI.KEF/1-FYZ-217/22 - Electromagnetism or FMFI.KEF/1-TEF-204/22 - Electricity and Magnetism

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

Learning outcomes:
Acquisition of skills in registration and data processing by computer, measurement of electrical and magnetic quantities. Physical interpretation and written / graphic presentation of processed results.

Class syllabus:
In the initial two or three exercises, joint acquisition of skills and measurement with analog and digital devices (oscilloscope, digital multimeter, A / D converter), processing of measured data by computer. This is followed by five to six separate laboratory works on electricity and magnetism selected from the offer: electrical properties of substances - electric bridges, Hall effect; electric field mapping; magnetic field mapping - air coils; electromagnetic induction - transformer; electrical RLC oscillations - transient RLC phenomenon, serial and parallel RLC circuit; magnetic properties of substances - hysteresis loops, permeability of substances, separation of magnetic losses; fuel cell; determination of the specific charge of an electron (e / m0).

Recommended literature:
- e-learning systém k predmetu s aktualizovanými podkladmi k experimentom
- Fyzikálne praktikum II : Návody na praktické cvičenia z elektriny a magnetizmu / Ján Pavlík. Bratislava : Univerzita Komenského, 2002
- Elektromagnetizmus, Andrej Tirpák, Bratislava: Polygrafia SAV, 1999

Languages necessary to complete the course:
Slovak, English (designations of instrument controls and their manuals)

Notes:
Recommended range of instruction (in hours): 39
Weekly: 2P + 1H Period of study: 27 P (9 weeks x3h) +12 H (4 weeks x3h)

Past grade distribution
Total number of evaluated students: 85

A	B	C	D	E	FX
61,18	25,88	3,53	2,35	2,35	4,71

Lecturers: doc. RNDr. Tomáš Roch, Dr. techn., Mgr. Branislav Grančič, PhD., Ing. Pavol Ďurina, PhD., doc. RNDr. Juraj Országh, PhD., Mgr. Leonid Satrapinskyy, PhD., Mgr. Ľubomír Staňo, PhD., Mgr. Veronika Hidaši Turiničová, PhD.

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-221/22	Practical in mechanics and molecular physics

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

Number of credits: 3

Recommended semester: 3.

Educational level: I.

Prerequisites:

Course requirements:
Continuous assessment: control of preparation for the internship, elaboration of reports from internships
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): Weight of the intermediate / final evaluation: 100/0

Learning outcomes:
Deepening and use of theoretical knowledge of mechanics and molecular physics, mastering basic physical measurement methods. The student will master the basic habits of independent scientific work in physical research: working with literature, keeping laboratory protocol, obtaining experimental erudition, critical evaluation of measurement and physical interpretation of processed results, written processing of individual physical problems in the form of a paper.

Class syllabus:
In practice, students will gain skills in experimental verification of some basic physical laws (gravitational, Hook's, equation of state, etc.), quantitative investigation of physical events (state changes, oscillations, polytropic action, etc.) and measurement of some basic physical quantities (modules elasticity, density, viscosity, speed of sound, air humidity, surface tension, gravitational constant, gravitational acceleration,…).
Tasks: Density measurement. Measurement of modulus of elasticity. Vibrations of coupled pendulums. Measurement of gravity acceleration. Moment of inertia measurement. Gravitational constant measurement. Heat capacity measurement. Group heat measurement. Determination of dynamic viscosity of fluids. Measurement of dynamic viscosity of liquids by commercial viscometers. The fall of a sphere in a confined gaseous environment. Polytropic story. Determination of surface tension of liquids. Measurement of relative and absolute humidity. Measuring the speed of sound in air. Basic properties of oscillating motion.
Some tasks are equipped with sensors and transducers that allow the registration and processing of measured data by computers. For some tasks, conventional measuring instruments and aids are used.

Recommended literature:

Practicum in Mechanics and Molecular Physics / Nadežda Zrubáková, Elena Brežná, Božena Pisoňová. Bratislava: Comenius University, 2003
Practicum in Mechanics and Molecular Physics / Nadežda Zrubáková, Elena Brežná, Božena Pisoňová. Bratislava: Comenius University, 1999

Languages necessary to complete the course:
Slovak and English

Notes:
Recommended range of instruction (in hours): 39
Weekly: 2P + 1H Period of study: 27 P (9 weeks x3h) +12 H (4 weeks x3h)

Past grade distribution
Total number of evaluated students: 80

A	B	C	D	E	FX
62,5	12,5	10,0	3,75	1,25	10,0

Lecturers: doc. RNDr. Juraj Országh, PhD., doc. RNDr. Veronika Medvecká, PhD., RNDr. Ladislav Moravský, PhD., doc. RNDr. Anna Zahoranová, PhD., doc. Mgr. Dušan Kováčik, PhD.

Last change: 22.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-FYZ-321/22	Practical in optics

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

Number of credits: 3

Recommended semester: 5.

Educational level: I., I.II.

Prerequisites:

Recommended prerequisites:
1-FYZ-218/22 Optics (Physics 2/S), or 1-UFY-210/00 Waves and Optics (Physics Teacher Training in combination 2/S), or 1-TEF-205 Optics (Technical Physics 2/S)
or 1-FYZ-211/17 Electromagnetism and Optics (Physics 2/W)

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

Learning outcomes:
Physical interpretation and written / graphic presentation of processed results.

Class syllabus:
Through a series of measurements, we get acquainted with basic concepts and phenomena such as: light sources - radiation - reflectivity - absorption - photometry - basic photometric quantities. Next, we examine phenomena such as - light interference (two-beam interference, multi-beam interference), diffraction, light dispersion, refractive index, light polarization, optical activity. From the lecture we will repeat the basics of optical imaging - geometric optics and explain the construction of selected optical instruments, such as: photometer, microscope, telescope, monochromator, spectrometer, refractometer, interferometer, etc.) Some will be constructed and their parameters verified. We will measure some basic physical constants.
Each mathematical formulation of the investigated physical dependence (phenomenon) can be transformed into a certain measurable dependence (dependent on the so-called parameters). These are usually of various importance in terms of the phenomenon under study. In addition to storing the measured data, it is appropriate to display the measured data continuously graphically, which allows, especially when compared with the expected functional dependence, better visual inspection and more prompt detection and possible elimination of found errors.
There is a computer for each task. It includes instructions for the task, a program for evaluating measurements and graphical display of measured data and a program for a virtual experiment in

the case of distance learning or. the need to carry out a parallel experiment to better understand the phenomenon. The measured tasks and their selection can be adapted to the respective field of study.

Recommended literature:
- Web = instructions for the subject with updated data for experiments
- Pavel Vojtek: Practical exercises in optics, MFF UK, 1992, scripts
- Štrba A., Mesároš V., Senderáková D .: Optics with Examples, MFF UK, 1996, scripts

Languages necessary to complete the course:
Slovak, English (designations of instrument controls and their manuals)

Notes:
Recommended range of instruction (in hours): 39
Weekly: 2P + 1H Period of study: 27 P (9 weeks x3h) +12 H (4 weeks x3h)

Past grade distribution
Total number of evaluated students: 35

A	B	C	D	E	FX
71,43	25,71	2,86	0,0	0,0	0,0

Lecturers: RNDr. Ján Greguš, PhD., Mgr. Michaela Horňáčková, PhD., RNDr. Pavel Vojtek, CSc., RNDr. Zuzana Zábudlá, Mgr. Branislav Grančič, PhD.

Last change: 22.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 1186

A	B	C	D	E	FX
29,26	11,47	10,46	7,42	12,06	29,34

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

Last change: 26.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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) or FMFI.KAI/1-AIN-130/16 - 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: 1124

A	B	C	D	E	FX
34,79	12,81	11,21	9,25	13,79	18,15

Lecturers: RNDr. Andrej Blaho, PhD.

Last change: 26.06.2022
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTF/1-FYZ-310/15	Quantum Theory (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: 5.

Educational level: I.

Prerequisites:

Recommended prerequisites:
1-FYZ-231/22 Úvod do modernej fyziky
(Introduction to Modern Physics Course)

Course requirements:
Grades obtained during the semester are based on solutions to 10 or 11 homework problem sets and midterm exam
Final Exam: written exam
Marks: A 70%+ max grade, B 60%+ max grade, C 50%+ max grade, D 40%+ max grade, E 33% + max grade
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Learning the basic ideas of quantum mechanics and limitations of macroscopic classical physics. Acquiring knowledge of elementary mathematical formalism and problem solving skills. Developing physics thinking required to control quantum systems.

Class syllabus:
Introduction: from the "one meter" dimension to the dimension of atoms. Atomic nuclei, nucleons and quarks. Standard Model of elementary particles. Uncertainty principle. Stability of atoms and origin of their typical size and typical binding energy. Typical size and typical binding energy of the atomic nucleus.
Basic concepts of elementary quantum mechanics: wave function and operators.
Wave function and mathematical description of a double-slit experiment with electrons. The principle of superposition.
Measurement in quantum mechanics.
Particle in an infinite well. Physical significance and properties of the wave function.
Free particle. Wave packets based on the principle of superposition to describe a free particle.
Time-dependent and time-independent Schrodinger equations. Stationary states.
Linear and Hermitian operators acting on the space of wave functions.
Properties of Hermitian operators. Operators corresponding to simple

physical quantities known from classical physics. Commutator and its significance.
Derivation of the uncertainty principle.
Time evolution of the general wave function and time evolution of the mean values of physical quantities.
Exact derivation of bound state solutions of simple quantum systems and their properties.
The final potential well and its graphical solution.
A simple harmonic oscillator and ladder operators (i) in the representation of wave functions, (ii) in the general Dirac bra / ket formalism, (iii) in the energy representation.
Angular momentum: eigenvalues and eigenfunctions. Properties of spherical harmonics.
Derivation of the exact solution for a hydrogen atom (Coulomb potential) and properties of the wave functions of the ground state and lowest excited states.
Spin.
Stern-Gerlach experiment. Orbital vs. spin angular momentum of the electron.
Spin description formalism: spinors and 2x2 Hermitian matrices corresponding to the spin projection operators on the x, y, z axes and on the axis given by a general unit vector.
Pauli matrices and their properties, their eigenvalues and eigenvectors.
Spin precession in an external homogeneous magnetic field.
Time-independent perturbation theory for non-degenerate states as an example of an approximate method for solving the time-independent Schrodinger equation. Usefulness of the method and convergence criteria. Derivation and properties of the solution in the first-order perturbation theory. Motivation for the second order. Energy levels in the second-order perturbation theory - derivation and examples.

Recommended literature:
Úvod do kvantovej mechaniky / Ján Pišút, Ladislav Gomolčák, Vladimír Černý. Bratislava : Alfa, 1983
Zbierka úloh z kvantovej mechaniky / Ján Pišút, Vladimír Černý, Peter Prešnajder. Bratislava : Alfa, 1985 (No English translations exist.)
D.J.Griffiths: Introduction to Quantum Mechanics, 2ed, Pearson Education Inc, 2005

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 277

A	B	C	D	E	FX
20,94	9,39	11,91	19,49	27,44	10,83

Lecturers: doc. RNDr. Tomáš Blažek, PhD.

Last change: 10.03.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 738

A	B	C	D	E	FX
57,86	16,53	10,98	4,2	1,76	8,67

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 212

A	B	C	D	E	FX
69,34	17,92	8,96	2,36	0,0	1,42

Lecturers: Viktoria Mirsalova

Last change: 20.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 113

A	ABS	B	C	D	E	FX	NEABS
32,74	23,89	8,85	6,19	0,88	0,0	24,78	2,65

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 86

A	ABS	B	C	D	E	FX	NEABS
62,79	18,6	1,16	1,16	0,0	0,0	9,3	6,98

Lecturers: Mgr. Aneta Barnes

Last change: 21.06.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 300

A	B	C	D	E	FX
99,0	0,33	0,33	0,0	0,0	0,33

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 297

A	B	C	D	E	FX
92,59	0,0	0,0	0,0	0,34	7,07

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 55

A	B	C	D	E	FX
98,18	0,0	0,0	0,0	0,0	1,82

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 40

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

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. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-301/22	Statistical Physics and Thermodynamics

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: 8

Recommended semester: 5.

Educational level: I.

Prerequisites:

Course requirements:
The form of the evaluation: written test during the course – weight 30 %, written and oral exam – weight 70 %. Evaluation A – at least 90 %, B – at least 80 %, C – at least 70 %, D – at least 60 %, E – at least 50 %.
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After completing the course the student will gain knowledge of basic theoretical methods and experimental facts from the area of statistical physics and thermodynamics. He/she will be able to explain the basic experimental facts theoretically. He/she will also gain ability to solve various practical problems in which the laws of thermodynamics and statistical physics play a major role.

Class syllabus:
Macroscopic systems, fundamentals of the probability theory, statistical physics of simple quantum macrosystems (system of spins, system of particles in quantum box), thermal and diffusion contact between arbitrary quantum macrosystems, entropy, absolute temperature, chemical potential, canonical distributions, Fermi and Bose distribution, applications (Bose condensation, black body radiation, Nyquist noise), statistical physics of classical systems, equipartition law, heat capacity, laws of thermodynamics, principles of measurements of absolute temperature, calorimetric measurements of heat and heat capacity, thermal machines, Carnot cycle, thermodynamic potentials and their applications (ideal gas, magnetism, chemical reactions, phase transitions and equilibrium between phases, transport phenomena (diffusion, heat conduction, transport of momentum - viscosity), electrical conduction of materials (Boltzmann transport equation, statistics of conduction electrons in metals and semiconductors, thermionic emission)

Recommended literature:
Thermal physics / Charles Kittel, Herbert Kroemer. New York : W. H. Freeman, 1980
Scripta on statistical physics in Slovak: Štatistická fyzika / Martin Moško, Antónia Mošková..
http://kflin.elf.stuba.sk/~ballo/SimLab/skripta/

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 9

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

Lecturers: doc. RNDr. Richard Hlubina, DrSc.

Last change: 25.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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: 68

A	B	C	D	E	FX
51,47	20,59	7,35	4,41	4,41	11,76

Lecturers: Mgr. Ing. Jana Kočvarová

Last change: 11.04.2024
Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

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. Dr. Štefan Matejčík, DrSc.

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KEF/1-TEF-951/19	**Course title:** Technical Physics
Number of credits: 4	
Recommended semester: 5., 6..	
Educational level: I.	
Course requirements: Exam weight in rating: 100% It is necessary to obtain at least 90% of points to obtain A grade, at least 80% of points to grade B, at least 70% of points to grade C, at least 60% of points to grade D and at least 50% to grade E. Scale of assessment (preliminary/final): 0/100	
Learning outcomes: The result will be a state exam.	
Class syllabus: The student draws three questions from five topics so that no two are from the same field: mechanics, molecular physics, statistical physics, thermodynamics, electromagnetism, optics and modern physics. If this happens, the second question will be invalid and another will be sought. The student has 5 minutes to present the answer for one question and another 5 minutes are set aside for discussion with the commission.	
State exam syllabus:	
Last change: 03.02.2022	
Approved by: prof. Dr. Štefan Matejčík, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-211/19	Thermophysics

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:

Learning outcomes:

Class syllabus:
Thermal properties of materials: thermal conductivity, boundary conditions, mathematical description of heat transfer. Thermal conductivity of composits. Measurement of thermophysical parameters. Radiative heat transfer. thermoelectric phenomena.

Recommended literature:
Convective heat and mass transfer / W. M. Kays, M. E. Crawford. New York : McGraw-Hill, 1993
Radiative heat transfer / Michael F. Modest. New York : McGraw-Hill, 1993
Ozisik M.N.: Heat Transfer: A Basic Approach McGraw-Hill Book Comp.
F. Incropera et al: Incropera's principles of Heat and Mass Transfer, J Willey 2017

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 16

A	B	C	D	E	FX
25,0	12,5	18,75	25,0	0,0	18,75

Lecturers: doc. Ing. Peter Bokes, PhD.

Last change: 17.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KEF/1-TEF-112/22	Treatment of Experimental Data

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

Number of credits: 3

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 70/30

Learning outcomes:
The student will master the theoretical principles and gain practical experience in evaluating data from physical experiments using "data flow" programming.

Class syllabus:
Sources of measurement uncertainties. Characteristics of statistical files (averages, dispersion,…). Dispersion folding rule, correlation coefficient. Spreading uncertainties. Evaluation of functional dependencies, nonlinear scales on graph axes, center of gravity method of finding the most probable form of the measured dependence, spline curves. Least squares method for straight line, and generally linear and nonlinear functions, weighting coefficients. Calibration by regression method, prediction bands, uncertainty of the quantity determined from the calibration curve, critical level, detection limits.

Recommended literature:

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 15

A	B	C	D	E	FX
46,67	13,33	0,0	0,0	33,33	6,67

Lecturers: doc. Mgr. Peter Čermák, PhD.

Last change: 02.02.2022

Approved by: prof. Dr. Štefan Matejčík, DrSc.