# Course descriptions
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# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

| **University:** Comenius University Bratislava |
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| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:** FMFI.KEF/1-FYZ-232/15 | **Course title:** Advanced Programming |
|---|---|

**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:** 6.

**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.

**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: 187

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 56,68 | 10,16 | 9,63 | 4,81 | 7,49 | 11,23 |

**Lecturers:** prof. RNDr. Peter Markoš, DrSc., doc. RNDr. Peter Papp, PhD.

**Last change:** 09.03.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

| | |
|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

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|---|---|
| **Course ID:**<br>FMFI.KAG/1-FYZ-115/13 | **Course title:**<br>Algebra and Geometry (1) |

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

**Number of credits:** 5

**Recommended semester:** 5.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Continuous assessment: test
 Examination: written and oral examination
 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 basic concepts and methods of linear algebra will be able to use them in geometry and physics.

**Class syllabus:**
 Sets and representations, 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: 407

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14,25 | 18,92 | 19,16 | 16,22 | 24,57 | 6,88 |

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

**Last change:** 18.05.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-TEF-322/19 | **Course title:**<br>Applied Optics |
|---|---|

**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:** 7.

**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: 1

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

**Lecturers:** doc. Mgr. Peter Čermák, PhD., doc. RNDr. František Kundracik, CSc.

**Last change:**

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:** FMFI.KEF/1-TEF-910/19 | **Course title:** 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:** 3

**Recommended semester:** 7.

**Educational level:** I.

**Prerequisites:**

**Recommended prerequisites:**
 none

**Course requirements:**
 Active individual work
 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:**
 English

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 5

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

**Lecturers:** prof. RNDr. Peter Markoš, DrSc.

**Last change:** 17.02.2022

**Approved by:**

# STATE EXAM DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |
| **Course ID:**<br>FMFI.KEF/1-TEF-991/19 | **Course title:**<br>BSc Thesis Defense |
| **Number of credits:** 8 | |
| **Recommended semester:** 7., 8.. | |
| **Educational level:** I. | |
| **Course requirements:**<br>Exam: oral<br>Scale of assessment (preliminary/final): 0/100 | |
| **Learning outcomes:**<br>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:**<br>Slovak, English | |
| **Last change:** 08.03.2022 | |
| **Approved by:** | |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI-PriF.KBCh/1-KXX-004/20 | **Course title:**<br>Basic Chemical Calculation |
|---|---|

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

**Number of credits:** 2

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Two written test with 30 and 70 points during the semester. A: 90%, B: 80%, C 70%, D 60%, E 50%
 Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
 Overview of high school curriculum: types of chemical formulas, methods of expressing the amount of chemical substances, composition of solutions, definition and determination of oxidation number and its use in nomenclature and redox reactions. Learn to write non-redox and redox chemical reactions. Mastering stoichiometric calculations.

**Class syllabus:**
 Basic quantities used in chemical calculations: amount of substance, volume, mass, the number of particles. The relationship between the amount of substance and the volume of an ideal gas. Quantities expressing the composition of solutions. Calculations with mass fraction and mass concentration. Balance equations. Calculations with molality, volume fraction and mass concentration. Recalculations of different ways of composition of solutions. Solubility and preparation of saturated solutions. Stoichiometry of chemical compounds. Stoichiometry of chemical equations.

**Recommended literature:**
 Silný, P. a kol.: Úlohy a modely usmerňovania úloh zo všeobecnej chémie. Expol Pedagogika, 1999.
 Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 2. vyd. Bratislava : UK, 2003.
 Ulická, Ľ., Ulický, L.: Príklady zo všeobecnej a anorganickej chémie. ALFA, SNTL 1984.
 Tatiersky, J.: Základné chemické výpočty. 2. vyd. Bratislava : UK, 2013.

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

**Notes:**

| Past grade distribution | | | | | |
|---|---|---|---|---|---|
| Total number of evaluated students: 0 | | | | | |
| A | B | C | D | E | FX |
| 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |

**Lecturers:** prof. RNDr. Jozef Nosek, DrSc., doc. RNDr. Martin Putala, CSc.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KEF/2-FOL-116/15 | **Course title:**<br>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:** 5.

**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: 101 | | | | | |
| A | B | C | D | E | FX |
| 95,05 | 0,0 | 3,96 | 0,0 | 0,0 | 0,99 |

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

**Last change:** 27.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

| | |
|---|---|
| **University:** Comenius University Bratislava | |

| | |
|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

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|---|---|
| **Course ID:**<br>FMFI-PriF.KJCh/1-KXX-014/20 | **Course title:**<br>Basic Laboratory Practice |

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

**Number of credits:** 4

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Regular tests and written protocols. A:90%, B:80%, C:70%, D:60%, E:50%
 Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
 While working in the laboratory, the student will gain basic practical experience and skills in a chemical laboratory.

**Class syllabus:**
 Physical quantities and units. Laboratory glassware. Weighing, measuring the volume of liquid. Preparation and dilution of solutions. Quantitative analysis. Basic laboratory operations (crystallization, filtration, decantation, drying, etc.)

**Recommended literature:**
 Nagyová I., Melichová Z., Kmeťová J.: Laboratórna technika. FPV UMB, Banská. Bystrica, 2010.
 Tatiersky J.: Základné chemické výpočty. UK, Bratislava, 2011.
 Galamboš M., Tatiersky J., Krivosudský L. a kol.: Názvoslovie anorganických látok. UK, Bratislava, 2021.
 Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 2. vyd. Bratislava : UK, 2003.

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

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 0

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

| |
|---|
| **Lecturers:** doc. RNDr. Martin Putala, CSc., prof. RNDr. Jozef Nosek, DrSc., PaedDr. Anna Drozdíková, PhD. |
| **Last change:** 15.03.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 | |
|---|---|
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |
| **Course ID:**<br>FMFI-PriF.KAgCh/1-KXX-005/20 | **Course title:**<br>Basics of Chemistry (1) |

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

**Number of credits:** 5

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Regular tests, final exam. A:90%, B:80%, C:70%, D:60%, E:50%

**Learning outcomes:**
 The student is able to define concepts, quantities and laws in the field of chemistry, can explain the principles of chemical processes, apply knowledge in solving chemical problems related to everyday life. He/she knows the connections between the composition, structure and properties of substances.

**Class syllabus:**
 Basic concepts and most important constants. Atomic nucleus; nuclear transformations; nuclear reactions. Electron shell of an atom; quantum numbers, orbitals, electron configuration of chemical elements. Periodic table of elements, classification of elements. Strong and weak interactions between particles, chemical bonding. Electronegativity of an atom. Oxidation number. Nomenclature. Charge number. Binding polarity. Molecule structure; localized electron pair theory. Polarity of molecules and substances. Isomerism. Group states of substances. Systems of substances - pure substance, element, compound, mixture. Solutions; composition of solutions. Chemical reactions, chemical equations. Types of chemical reactions. Thermodynamics and rate of chemical reactions, chemical equilibrium. Acids and bases, acid-base reactions, hydrolysis of salts. The concept of pH, strength and saturation of acids and bases. Redox reactions. Precipitation reactions. Complexation reactions.

**Recommended literature:**
 Galamboš, M. a i.: Názvoslovie anorganických látok. 2. oprav. a rozš. vyd. Bratislava: Univerzita Komenského, 2011.
 Žúrková, Ľ. a i.: Všeobecná chémia. 1. vyd. Bratislava : SPN, 1985.
 Krätsmár-Šmogrovič a kol.: Všeobecná a anorganická chémia, vyd. Martin, Osveta 2007.

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

| Notes: | | | | | |
|---|---|---|---|---|---|
| **Past grade distribution**<br>Total number of evaluated students: 3 | | | | | |
| A | B | C | D | E | FX |
| 33,33 | 0,0 | 0,0 | 0,0 | 0,0 | 66,67 |
| **Lecturers:** RNDr. Jana Chrappová, PhD. | | | | | |
| **Last change:** 21.06.2022 | | | | | |
| **Approved by:** | | | | | |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

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|---|---|
| **Course ID:**<br>FMFI-PriF.KAgCh/1-KXX-015/20 | **Course title:**<br>Basics of Chemistry (2) |

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

**Number of credits:** 5

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Regular tests, final exam. A:90%, B:80%, C:70%, D:60%, E:50%

**Learning outcomes:**
The student will gain basic knowledge about common chemical elements and their compounds, will know their properties, use in everyday life and their impact on living organisms and the environment. He knows the basic division of organic substances, their properties and impact on the environment.

**Class syllabus:**
1. Hydrogen, alkali metals, alkaline earth metals, water, water hardness. 2. Aluminum, carbon, silicon, nitrogen, phosphorus, greenhouse gases, glass and ceramics. 3. Oxygen, sulfur, ozone, acid rain. 4. Halogens, rare gases. 5. Chromium, manganese, iron, steel, corrosion. 6. Copper subgroup and zinc subgroup, amalgam. 7. Characteristics and distribution of organic substances 8. Bonding of atoms, chemical formulas of organic compounds, nomenclature 9. Acid-base equilibria in organic chemistry, electron effects 10. Hydrocarbons 11. Hydrocarbon derivatives (X, OH, N) 12. Hydrocarbon derivatives (C=O)

**Recommended literature:**
Silný P., Brestenská, B. Prehľad chémie 1, SPN, 2000.
Zahradník, P., Kollárová, M. Prehľad chémie 2, SPN, 2002.
Krätsmár-Šmogrovič a kol.: Všeobecná a anorganická chémia, vyd. Martin, Osveta 2007

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

**Notes:**

| Past grade distribution | | | | | |
|---|---|---|---|---|---|
| Total number of evaluated students: 1 | | | | | |
| A | B | C | D | E | FX |
| 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 100,0 |

**Lecturers:** RNDr. Jana Chrappová, PhD., Mgr. Henrieta Stankovičová, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
|---|

| **University:** Comenius University Bratislava |
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| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:** FMFI.KAG/1-KXX-007/20 | **Course title:** Basics of Mathematics (1) |
|---|---|

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

| **Number of credits:** 6 |
|---|

| **Recommended semester:** 1. |
|---|

| **Educational level:** I. |
|---|

| **Prerequisites:** |
|---|

| **Course requirements:** |
|---|
| The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments. |

The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests.
Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0).
Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test).

| **Learning outcomes:** |
|---|
| Students will gain the necessary skills in manipulation with numbers, mathematical expressions, elementary functions. They will expand their knowledge of geometry. |

| **Class syllabus:** |
|---|
| 1. Mathematical terminology and mathematical logic. Basics of proper mathematical expression and designation. |

2. Logical formulae and proofs. Types of mathematical proofs illustrated in elementary examples.
3. Sets and number sets (basic operations with numbers and expressions, numbers, various notations, fractions). Numbers and their geometric representation on a line (absolute value and its geometric meaning).
4. Elementary number theory, divisibility, prime numbers, compound numbers.
5. Expressions, linear and quadratic expressions with variables. Properties of mathematical operations (commutation, distribution, simplification, etc.)
6. Elementary functions (polynomial, linear, quadratic, n-th power and n-th root, trigonometric, exponential, logarithmic functions, their properties and calculation). The graph of a real function and its basic properties.

7. Equations and inequalities of one variable (linear and quadratic, with absolute value, with n-th power and n-th root, trigonometric, exponential, logarithmic). Calculator vs. adjustment before enumeration.

**Recommended literature:**
Základy matematiky / Mário Boroš : Ikar, 2016
Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia

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

**Notes:**

**Past grade distribution**
Total number of evaluated students: 18

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0,0 | 27,78 | 22,22 | 0,0 | 5,56 | 44,44 |

**Lecturers:** RNDr. Martina Bátorová, PhD.

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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|---|
| **University:** Comenius University Bratislava |

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|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:**<br>FMFI.KAG/1-KXX-017/20 | **Course title:**<br>Basics of Mathematics (2) |
|---|---|

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

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|---|
| **Number of credits:** 6 |

| |
|---|
| **Recommended semester:** 2. |

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|---|
| **Educational level:** I. |

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|---|
| **Prerequisites:** |

| |
|---|
| **Course requirements:**<br>The student can get 50% for exercises and 50% for the final exam. The student must obtain at least half of the points for the exercises in order to pass to the final exam. During the teaching part of the semester, the student obtains points via written homework assignments.<br>The final exam consists of a passfail test (10%) and a regular test (20% examples, 20% theoretical questions). Successful completion (8 points out of 10 points) of the passfail test is a necessary condition for admission to the regular test. To successfully pass the final exam, it is necessary to obtain at least half of the points together for both of the final exam tests.<br>Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), Fx (50-0).<br>Scale of assessment (preliminary/final): Preliminary assessment 50% (written homework assignments) / 50% final exam (10% passfail and 40% regular test). |

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|---|
| **Learning outcomes:**<br>Students will acquire the necessary skills in mathematical operations with complex numbers, combinatorics, basics of probability and statistics, and analytical and synthetic geometry in the plane and space. |

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|---|
| **Class syllabus:**<br>8. Basics of calculating sequences and series (arithmetic and geometric sequence, partial sums) and their applications.<br>9. Linear equations and inequalities with two or three unknowns and their solutions. Equation and inequalities with parameters.<br>10. Elementary analytical geometry in the plane (vectors, lines, triangle, polygon, circle, conic section, scalar product) and its relationship with solutions of equations. Isometries and similarities in plane.<br>11. Elementary analytical geometry in space (planes, vector product). Basic bodies and their imaging.<br>12. Complex numbers, calculations and their geometric properties (representations, basic operations, complex n-th power and n-th root, Moivre's theorem)<br>13. Basic combinatorial procedures without using the traditional formulae |

| 14. Basic concept of probability and statistics (reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator) 15. Limits via geometric and computational methods (basic rules of calculating limits, derivatives of elementary functions, graphs of functions and their properties) |
| --- |

**Recommended literature:**
Základy matematiky / Mário Boroš : Ikar, 2016
Seminár z matematiky 1-3 / Zbyněk Kubáček, Ján Žabka : Mapa Slovakia

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

**Notes:**

**Past grade distribution**
Total number of evaluated students: 9

| A | B | C | D | E | FX |
| --- | --- | --- | --- | --- | --- |
| 11,11 | 22,22 | 22,22 | 11,11 | 11,11 | 22,22 |

**Lecturers:** RNDr. Martina Bátorová, PhD.

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

| | |
|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-AIN-407/15 | **Course title:**<br>Brain and Mind |
|---|---|

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

| |
|---|
| **Number of credits:** 3 |

| |
|---|
| **Recommended semester:** 1., 3., 5. |

| |
|---|
| **Educational level:** I. |

| |
|---|
| **Prerequisites:** |

| |
|---|
| **Course requirements:** |

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| **Learning outcomes:** |

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| **Class syllabus:** |

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|---|
| **Recommended literature:** |

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

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| **Notes:** |

**Past grade distribution**
Total number of evaluated students: 154

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 48,05 | 18,83 | 15,58 | 8,44 | 2,6 | 6,49 |

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| **Lecturers:** RNDr. Barbora Cimrová, PhD., doc. PhDr. Ján Rybár, PhD. |

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| **Last change:** 21.03.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** <br> FMFI.KEF/1-TEF-111/19 | **Course title:** <br> 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:** 4.

**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: 9

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 66,67 | 11,11 | 0,0 | 0,0 | 0,0 | 22,22 |

**Lecturers:** doc. Ing. Maroš Gregor, PhD.

**Last change:** 27.01.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-AIN-408/15 | **Course title:**<br>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.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 54

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 70,37 | 12,96 | 7,41 | 1,85 | 0,0 | 7,41 |

**Lecturers:** doc. PhDr. Ján Rybár, PhD.

**Last change:** 14.03.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:** FMFI.KAG/1-KXX-002/20 | **Course title:** Complementary Classes in Mathematics (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.

**Prerequisites:**

**Course requirements:**
 Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
 Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
 Students gain basic skill in computation with numbers, mathematical expressions, elementary functions. They extend the knowledge on elementary geometry.

**Class syllabus:**
 1. Basic operations with numbers and expressions (numbers, notation, fractions, linear and quadratic expressions with variables, commutativity, distributivity, simplification, etc.)
 2. Relations of numbers and their geometric representation on a straight line, absolute value and its geometric significance, equations and inequalities with one variable and absolute value
 3. Elementary functions (polynomials, roots, sin, cos, exp, ln) and their relations, properties and computing with them, equations and inequlities, calculator vs. adjustment before enumeration.
 4. Linear equations with two, three unknowns and their solution
 5. Elementary analytical geometry in plane and space (vectors, straight lines, plane, triangle, circle, cone, solids) and link with the solutions of equations

**Recommended literature:**
 Lecturer materials.

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

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 10

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

| **Lecturers:** doc. RNDr. Pavel Chalmoviranský, PhD., Mgr. Adriana Bosáková, Ing. Martin Čavarga |
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| **Last change:** 22.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KAG/1-KXX-012/20 | **Course title:**<br>Complementary Classes in Mathematics (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.

**Prerequisites:**

**Course requirements:**
 Homeworks (written solutions of problems and their consulting 100%). Rough evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
 Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
 Students extends their knowledge and skills in mathematical operations with complex numbers, combinatorics, basic probability and the description of elementary functions.

**Class syllabus:**
 6 . complex numbers, computation and their geometric properties
 7. elementary number theory, divisibility, prime numbers, graphs
 8. basic combinatorial methods and solutions without the help of traditional formulas
 9. basic notion of probability and statistics, reading diagrams and understanding of basic statistical indicators, basic understanding of the relationship between truth and statistical indicator
 10. basics of calculating sequences and series, partial sums, applications (interest, ...)
 11. concept of limits geometrically and computationally, basic rules of limit calculation, derivatives of elementary functions, course of function
 12. logic and the need for proof illustrated in elementary examples

**Recommended literature:**
 Lecturers materials.

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

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 7

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 71,43 | 14,29 | 14,29 | 0,0 | 0,0 | 0,0 |

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| **Lecturers:** Ing. Martin Čavarga |
| **Last change:** 22.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KDMFI/1-KXX-001/20 | **Course title:**<br>Complementary Classes in Physics (1) |
|---|---|

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

| |
|---|
| **Number of credits:** 2 |

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|---|
| **Recommended semester:** 1. |

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|---|
| **Educational level:** I. |

| |
|---|
| **Prerequisites:** |

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|---|
| **Course requirements:**<br>A:90%, B:80%, C:70%, D:60%, E:50%<br>Scale of assessment (preliminary/final): 100/0 |

| |
|---|
| **Learning outcomes:**<br>Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus. |

| |
|---|
| **Class syllabus:**<br>Complex problems in the context of water (hydrostatic force in a liquid, Archimedes' law, continuity equation for liquids and gases, Bernoulli's equation for liquids, resistive force when moving a solid in a liquid)<br>Complex tasks in the context of electricity and magnetism (motion of a charged particle in a homogeneous electric and in a homogeneous magnetic field, motion of a conductor in a magnetic field, motion of a magnet in a coil)<br>Complex tasks in the context of sound (origin of sound, speed of sound propagation, equation of gradual waves, standing waves on a stretched string and on an air column, sound interference)<br>Complex tasks in the contexts of photoelectric effect and X-rays. |

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|---|
| **Recommended literature:**<br>Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006<br>Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013<br>Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012<br>Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016 |

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

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

**Notes:**

**Past grade distribution**
Total number of evaluated students: 10

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30,0 | 20,0 | 0,0 | 0,0 | 0,0 | 50,0 |

**Lecturers:** PaedDr. Lukáš Bartošovič, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KDMFI/1-KXX-011/20 | **Course title:**<br>Complementary Classes in Physics (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.

**Prerequisites:**

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

**Learning outcomes:**
Students will develop skills to solve complex physical problems at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.

**Class syllabus:**
Complex problems in the context of translational motion of a point mass (force action, momentum, force impulse, Newton's laws of motion, elastic and inelastic collision, explosion, force action for circular motion).
Complex problems in the context of a rigid body (moment of inertia, energy of a rotating body)
Complex problems in the context of air (ideal gas, ideal gas phenomena, Avogadro's constant, internal energy of a body, heat capacity, energy transfer by flow, conduction and radiation, movement of a body in air).
Complex problem in the context of light (beam optics, dispersion, interference and diffraction of light, black body radiation, light and energy levels of atoms)
Complex problem in the context of energy conservation law.
Complex problem in the context of conservation laws (energy, momentum, electric charge)

**Recommended literature:**
Fyzika pre gymnázium - všeobecnovzdelávací kurz : Experimentálny učebný text pre všeobecnovzdelávací program vyučovania fyziky v prvých dvoch ročníkoch štvorročného gymnázia. (Pracovná verzia) / Viera Lapitková, Václav Koubek, Peter Demkanin. Bratislava : Knižničné a edičné centrum FMFI UK, 2006
Fyzika pre 2. ročník gymnázia a 6. ročník gymnázia s osemročným štúdiom / Peter Demkanin ... [et al.]. Bratislava : Združenie EDUCO, 2013
Fyzika pre 3. ročník gymnázia a 7. ročník gymnázia s osemročným štúdiom / Peter Demkanin, Martina Horváthová. Prievidza : EDUCO, 2012

Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016
Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013
Fyzika 2 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

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

**Notes:**

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

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

**Lecturers:** PaedDr. Lukáš Bartošovič, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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|---|---|
| **Course ID:** <br> FMFI.KEF/1-AIN-140/16 | **Course title:** <br> Computer Principles - Hardware |

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

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|---|
| **Number of credits:** 6 |

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|---|
| **Recommended semester:** 7. |

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| **Educational level:** I. |

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| **Prerequisites:** |

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| **Antirequisites:** FMFI.KEF/1-AIN-140/15 |

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| **Course requirements:** <br>  Scale of assessment (preliminary/final): 50/50 |

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| **Learning outcomes:** |

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| **Class syllabus:** <br> Principles of DDL, DTL a TTL circuits. Combinational and sequential schemes, their optimalization and practical applications (RS- and D- type flip-flops, counter and shift register). Multiplexer and demultiplexer, paralel-serial code converter, RS232 interface, statical RAM memory, delta modulation and simple digital sound recording. |

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| **Recommended literature:** <br>  faculty guidance documents |

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

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| **Notes:** |

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| **Past grade distribution** <br> Total number of evaluated students: 571 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 21,54 | 30,3 | 19,09 | 9,11 | 9,46 | 10,51 |

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| **Lecturers:** RNDr. Ján Greguš, PhD., doc. RNDr. František Kundracik, CSc. |

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| **Last change:** 21.09.2018 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KEF/1-FYZ-667/15 | **Course title:**<br>Computer Simulations in 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:** 7.

**Educational level:** I.

**Prerequisites:**

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

**Learning outcomes:**
After completing the course, the student will be able to apply current methods of computer simulations to effectively solve a wide range of problems in various fields of classical physics. The student will also be able to analyze, visualize and interpret the results obtained from simulations. The focus is on molecular dynamics and Monte Carlo methods, and an important part of the course is the solution of complex optimization problems that often occur in science and in everyday life. As part of practical exercises, the student will gain experience with the application of lectured methods on clusters, crystals and fluids, including phase transitions. The student will also get acquainted with computer simulations of seismic wave fields using the finite difference method.

**Class syllabus:**
 Use of computer simulations in physics - experiment, theory, simulations
 Mean values and fluctuations
 Ergodic theorem
 Molecular dynamics (MD)
 Classical description of interactions - force field
 Periodic boundary conditions, cutoff of interactions, Ewald summation for Coulomb potential
 MD at constant temperature and pressure, MD for molecular systems
 Simulation data processing - statistical error estimation
 Calculation of time correlation functions, connection with physical quantities
 MC - simple sampling, importance sampling, detailed equilibrium principle, Metropolis algorithm
 Optimization algorithms for complex problems - simulated annealing, evolutionary algorithms
 Free energy calculations, phase transitions, activated processes
 Quantum Simulations - Path Integral Monte Carlo
 Principles of finite difference method (KD), KD network, KD approximations, KD schemes, stability analysis

KD schemes for 1D elastic problem, material interfaces, free surface, computational domain boundaries, wave field excitation

**Recommended literature:**
Monte Carlo simulation in statistical Physics : An introduction / Kurt Binder, Dieter W. Heermann. New York : Springer, 1992
Numerical recipes in C++ : The Art of Scientific computing / William H. Press [et al.]. Cambridge : Cambridge University Press, 2002
The finite-difference method for seismologists : An introduction / Peter Moczo [et al.]. Bratislava : Comenius University, 2004
D. Frenkel, B. Smit, Understanding molecular simulations From algorithms to applications, Academic Press 2002
electronic material http://www.fmph.uniba.sk/fileadmin/user_upload/editors/sluzby/kniznica/el_materialy/ip_uk/Introduction_to_computer_simulation_methods.pdf

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

**Notes:**

**Past grade distribution**
Total number of evaluated students: 28

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 46,43 | 25,0 | 17,86 | 7,14 | 3,57 | 0,0 |

**Lecturers:** prof. Ing. Roman Martoňák, DrSc., prof. RNDr. Peter Markoš, DrSc., doc. Mgr. Jozef Kristek, PhD.

**Last change:** 23.02.2022

**Approved by:**

# COURSE DESCRIPTION

| Academic year: 2021/2022 |  |
|---|---|

| University: Comenius University Bratislava |  |
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| Faculty: Faculty of Mathematics, Physics and Informatics |  |
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| Course ID:<br>FMFI.KEF/1-TEF-204/19 | Course title:<br>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:** 7

**Recommended semester:** 5.

**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**<br>Total number of evaluated students: 6 | | | | | |
| A | B | C | D | E | FX |
| 16,67 | 50,0 | 0,0 | 16,67 | 0,0 | 16,67 |
| **Lecturers:** prof. Dr. Štefan Matejčík, DrSc., Mgr. Michal Stano, PhD. | | | | | |
| **Last change:** 01.02.2022 | | | | | |
| **Approved by:** | | | | | |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-TEF-302/19 | **Course title:**<br>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:** 6.

**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: 5 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 80,0 | 0,0 | 0,0 | 0,0 | 0,0 | 20,0 |

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

**Last change:** 20.01.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-233/13 | **Course title:**<br>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., 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: 215

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 67,44 | 13,02 | 6,51 | 1,86 | 1,4 | 9,77 |

**Lecturers:** Mgr. Aneta Barnes

| Last change: 21.06.2022 |
|---|
| Approved by: |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-234/13 | **Course title:**<br>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., 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: 146

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 77,4 | 12,33 | 3,42 | 1,37 | 0,0 | 5,48 |

**Lecturers:** Mgr. Aneta Barnes

| **Last change:** 21.06.2022 |
|---|
| **Approved by:** |

# COURSE DESCRIPTION

| Academic year: 2021/2022 |
|---|

| University: Comenius University Bratislava |
|---|

| Faculty: Faculty of Mathematics, Physics and Informatics |
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| Course ID:<br>FMFI.KJP/1-MXX-131/00 | Course title:<br>English Language (1) |
|---|---|

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

| Number of credits: 2 |
|---|

| Recommended semester: 1. |
|---|

| Educational level: I. |
|---|

| Prerequisites: |
|---|

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

| Learning outcomes:<br>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:<br>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:<br>Anglický jazyk pre študentov FMFI UK : Kurz pre mierne pokročilých / Alena Zemanová.<br>The textbook has not been published. It is at students' disposal in an electronic format.<br>Anglický jazyk pre študentov FMFI UK : Aplikovaná matematika / Alexandra Maďarová, Ľubomíra Kožehubová.<br>The textbook has not been published. It is at students' disposal in an electronic format.<br>Anglický jazyk pre študentov FMFI UK : Matematika / kolektív autorov KJP.<br>The textbook has not been published. It is at students' disposal in an electronic format.<br>Anglický jazyk pre študentov FMFI UK : Fyzika / Alena Zemanová.<br>The textbook has not been published. It is at students' disposal in an electronic format.<br>Anglický jazyk pre študentov FMFI UK : Informatika / Elena Klátiková.<br>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: 5840

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30,6 | 23,8 | 18,29 | 12,47 | 7,45 | 7,4 |

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

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-132/00 | **Course title:**<br>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.

**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: 1582

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 22,06 | 20,54 | 24,27 | 15,36 | 10,81 | 6,95 |

| |
|---|
| **Lecturers:** PhDr. Alena Zemanová, Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, Mgr. Ľubomíra Kožehubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD. |
| **Last change:** 20.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-231/00 | **Course title:**<br>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.

**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 Koźehubová.
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: 1326

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 16,06 | 19,53 | 23,23 | 18,1 | 17,5 | 5,58 |

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

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
|---|

| **University:** Comenius University Bratislava |
|---|

| **Faculty:** Faculty of Mathematics, Physics and Informatics |
|---|

| **Course ID:** FMFI.KJP/1-MXX-232/10 | **Course title:** 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. |
|---|

| **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**<br>Total number of evaluated students: 3345 | | | | | |
| A | B | C | D | E | FX |
| 27,23 | 28,4 | 21,29 | 11,21 | 5,77 | 6,1 |
| **Lecturers:** Mgr. Ing. Jana Kočvarová, Mgr. Alexandra Maďarová, PhDr. Alena Zemanová, Mgr. Ľubomíra Koževhubová, Mgr. Eva Foltánová, Mgr. Aneta Barnes, Mgr. Simona Tomášková, PhD. | | | | | |
| **Last change:** 17.06.2022 | | | | | |
| **Approved by:** | | | | | |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:** FMFI.KTF/1-FYZ-118/16 | **Course title:** 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: 180

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 35,0 | 22,22 | 15,0 | 12,78 | 6,67 | 8,33 |

**Lecturers:** Mgr. Peter Maták, PhD.

**Last change:** 09.03.2022

**Approved by:**

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
|---|

| **University:** Comenius University Bratislava |
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| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:**<br>FMFI.KTF/1-FYZ-119/16 | **Course title:**<br>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: 145

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 44,14 | 22,76 | 15,17 | 8,28 | 2,76 | 6,9 |

| **Lecturers:** Mgr. Peter Maták, PhD. |
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| **Last change:** 09.03.2022 |
|---|
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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|---|
| **University:** Comenius University Bratislava |

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|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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

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

| |
|---|
| **Number of credits:** 2 |

| |
|---|
| **Recommended semester:** 1. |

| |
|---|
| **Educational level:** I., II. |

| |
|---|
| **Prerequisites:** |

| |
|---|
| **Course requirements:** <br>  Scale of assessment (preliminary/final): 100/0 |

| |
|---|
| **Learning outcomes:** |

| |
|---|
| **Class syllabus:** <br>  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:** <br>  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: 435

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 45,75 | 20,0 | 18,85 | 8,74 | 2,3 | 4,37 |

| |
|---|
| **Lecturers:** Mgr. Ľubomíra Koževhubová |

| |
|---|
| **Last change:** 20.06.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

| | |
|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-142/00 | **Course title:**<br>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., 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: 265

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 38,87 | 25,28 | 19,62 | 10,19 | 2,64 | 3,4 |

**Lecturers:** Mgr. Ľubomíra Kožehubová

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-241/00 | **Course title:**<br>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., 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: 104

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 39,42 | 27,88 | 21,15 | 6,73 | 0,96 | 3,85 |

**Lecturers:** Mgr. Ľubomíra Kožehubová

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-242/00 | **Course title:**<br>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., 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: 74

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41,89 | 32,43 | 17,57 | 2,7 | 1,35 | 4,05 |

**Lecturers:** Mgr. Ľubomíra Koževubová

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** FMFI.KDMFI/1-KXX-006/20 | **Course title:** Fundamentals of Physics (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:** 5

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
Learning outcomes at the level of at least 50%.
Scale of assessment (preliminary/final): 60/40

**Learning outcomes:**
Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.

**Class syllabus:**
Deepening and expanding knowledge of high school curricula in the areas of: ideal gas, temperature, kinetic theory of gases; heat conduction, flow and radiation; absolute black body radiation; direct current; energy conservation law and photoelectric effect; energy conservation law and Bernoulli's equation; X-ray absorption and attenuation of light in an optical fiber; periodic phenomena and sound.

**Recommended literature:**
Giancoli, D., Physics: Principles with applications, 6th edition
Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5.,
Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia
Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia
Elektronic materials in moodle.uniba.sk

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

**Notes:**

| **Past grade distribution** Total number of evaluated students: 13 | | | | | |
|---|---|---|---|---|---|
| A | B | C | D | E | FX |
| 23,08 | 15,38 | 7,69 | 7,69 | 0,0 | 46,15 |

**Lecturers:** doc. RNDr. Peter Demkanin, PhD., PaedDr. Tünde Kiss, PhD., Mgr. Silvia Novotná

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KDMFI/1-KXX-016/20 | **Course title:**<br>Fundamentals of Physics (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:** 5

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Learning outcomes at the level of at least 50%.
 Scale of assessment (preliminary/final): 60/40

**Learning outcomes:**
 Students will develop skills in using facts, concepts and terminology from the areas listed in the brief course syllabus. They will develop skills to communicate physics information (graph, table, relationship, text) as well as to formulate questions worthy of research and hypotheses of experiments.

**Class syllabus:**
 Deepening and expanding knowledge from high school in the areas of: mechanics of a point mass; Atwood's machine; decomposition of force into components, free body diagram; movement of a point mass in a circle, centrifuge; mechanical work, mechanical energy; application of energy conservation law; the rotational effect of the force and rotation of a rigid body around a fixed axis; fluid mechanics; magnetic and electromagnetic phenomena; basics of optics.

**Recommended literature:**
 Giancoli, D., Physics: Principles with applications, 6th edition
 Halliday, D., Resnick, R., Walker, J., Fyzika 1. až 5.,
 Demkanin, P. a kol. Fyzika pre 2. ročník gymnázia
 Demkanin, P. a kol. Fyzika pre 3. ročník gymnázia
 Elektronic materials in moodle.uniba.sk

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 7

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 71,43 | 0,0 | 0,0 | 28,57 | 0,0 | 0,0 |

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| **Lecturers:** doc. PaedDr. Viera Haverlíková, PhD., PaedDr. Tünde Kiss, PhD. |
| **Last change:** 15.03.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KAI+KDMFI/1-<br>KXX-008/20 | **Course title:**<br>Fundamentals of Programming (1) |
|---|---|

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

**Number of credits:** 6

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Continuous assessment: homework, tests
 Exam: solving computer tasks
 It is necessary to obtain at least 90% of points to obtain A rating, 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): 70/30

**Learning outcomes:**
 After completing the course, students will be able to write short, simple programs in Python and master the basic methods of debugging in their own programs.

**Class syllabus:**
 Basic Python program structures: cycles, conditions, variables, functions, strings, files. Basic methods of finding errors in programs.

**Recommended literature:**
 Python programming : An introduction to computer science / John M. Zelle. Sherwood, Or. : Franklin, Beedle & Associates, 2010

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

**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:** RNDr. Michal Winczer, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** FMFI.KAI+KDMFI/1-KXX-018/20 | **Course title:** Fundamentals of Programming (2) |
|---|---|

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

**Number of credits:** 6

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Continuous assessment: homework, written tests
 Exam: solving computer tasks
 It is necessary to obtain at least 90% of points to obtain A rating, 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): 70/30

**Learning outcomes:**
 Students will get acquainted with the basic structures for storing data in Python. Through motivational examples, they will improve in writing and debugging simple programs and get acquainted with the basic principles of computer science.

**Class syllabus:**
 Advanced structures in Python (lists, n-tuples, matrices). Debugging programs. Motivational examples illustrating basic concepts of informatics. Examples of practical applications.

**Recommended literature:**
 Python 3 : Výukový kurz / Mark Summerfield ; překlad Lukáš Krejčí. Brno : Computer Press, 2010
 Sedem divov informatiky / Juraj Hromkovič ; preklad Michal Winczer. Ružomberok : Verbum, 2012

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

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 7

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

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| **Lecturers:** doc. Mgr. Tomáš Vinař, PhD., RNDr. Michal Winczer, PhD. |
| **Last change:** 15.03.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-151/00 | **Course title:**<br>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., 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: 734

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 36,1 | 27,25 | 19,62 | 8,99 | 2,72 | 5,31 |

**Lecturers:** Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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

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

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|---|
| **Number of credits:** 2 |

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| **Recommended semester:** 2. |

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|---|
| **Educational level:** I., II. |

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|---|
| **Prerequisites:** |

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| **Course requirements:**<br> Scale of assessment (preliminary/final): 100/0 |

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|---|
| **Learning outcomes:**<br> 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 ) |

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| **Class syllabus:**<br> 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.<br> 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 ) |

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| **Recommended literature:**<br> Appropriate study material is supplied by teacher based on the participants'level of German proficiency |

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

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| **Notes:** |

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| **Past grade distribution**<br> Total number of evaluated students: 480 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 36,04 | 20,21 | 20,83 | 13,13 | 3,33 | 6,46 |

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| **Lecturers:** Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD. |

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| **Last change:** 21.06.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-251/00 | **Course title:**<br>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., 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: 165

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41,21 | 25,45 | 20,61 | 6,67 | 2,42 | 3,64 |

**Lecturers:** Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD.

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-252/00 | **Course title:**<br>German Language (4) |
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| **Educational activities:**<br>  **Type of activities:** practicals<br>  **Number of hours:**<br>   **per week:** 2  **per level/semester:** 26<br>  **Form of the course:** on-site learning |

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| **Number of credits:** 2 |

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| **Recommended semester:** 4. |

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

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| **Prerequisites:** |

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| **Course requirements:**<br> Scale of assessment (preliminary/final): 100/0 |

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

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| **Class syllabus:**<br>The course is a follow-up to the German language (1-3). It provides a course of intermediate and advanced German language.<br>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). |

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

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

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| **Notes:** |

**Past grade distribution**
Total number of evaluated students: 90

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 42,22 | 24,44 | 12,22 | 12,22 | 3,33 | 5,56 |

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| **Lecturers:** Mgr. Alexandra Maďarová, Mgr. Simona Tomášková, PhD. |

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| **Last change:** 21.06.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-MXX-491/15 | **Course title:**<br>Integrated Education of People with Disabilities |
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| **Educational activities:**<br>  **Type of activities:** course<br>  **Number of hours:**<br>    **per week:** 2  **per level/semester:** 26<br>  **Form of the course:** on-site learning |
| **Number of credits:** 3 |
| **Recommended semester:** 1. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br> Total number of evaluated students: 55 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 78,18 | 18,18 | 1,82 | 0,0 | 0,0 | 1,82 |

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| **Lecturers:** PaedDr. Elena Mendelová, CSc. |
| **Last change:** 02.06.2015 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-FYZ-451/15 | **Course title:**<br>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:** 8.

**Educational level:** I.

**Prerequisites:** FMFI.KEF/1-FYZ-211/17 - Electromagnetism and Optics or FMFI.KEF/1-TEF-204/22 - Electricity and Magnetism

**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: 30

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 50,0 | 33,33 | 10,0 | 6,67 | 0,0 | 0,0 |

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

| **Last change:** 09.03.2022 |
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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-FYZ-452/18 | **Course title:**<br>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:** 8.

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

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 22

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 50,0 | 4,55 | 18,18 | 13,64 | 9,09 | 4,55 |

**Lecturers:** doc. RNDr. Richard Hlubina, DrSc.

**Last change:** 19.01.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KDMFI/1-AIN-112/15 | **Course title:**<br>Introduction to Web Technologies |
|---|---|

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

**Number of credits:** 6

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

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

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
Total number of evaluated students: 2357

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 41,54 | 14,55 | 13,58 | 11,41 | 8,53 | 10,39 |

**Lecturers:** PaedDr. Roman Hrušecký, PhD., RNDr. Marek Nagy, PhD.

**Last change:** 22.09.2017

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:** FMFI.KDMFI/1-KXX-003/20 | **Course title:** Laboratory Practicals in Physics (1) |
|---|---|

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

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|---|
| **Number of credits:** 4 |

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|---|
| **Recommended semester:** 1. |

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|---|
| **Educational level:** I. |

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|---|
| **Prerequisites:** |

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|---|
| **Course requirements:**<br>A: at least 90%, B at least 80%, C at least 70%, D at least 60%, E at least 50%.<br>Scale of assessment (preliminary/final): 100/0 |

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| **Learning outcomes:**<br>Students will develop skills to empirically examine physical phenomena at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus. |

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|---|
| **Class syllabus:**<br>Measurement of physical quantities (length, mass, volume, time, temperature, force, gas pressure, electric current, electric voltage, magnetic induction, lighting, sound frequency)<br>Physical dependence (independent and dependent variable, experiment constants), dependence graph, dependence table, mathematical description of dependence.<br>Direct ratio and linear dependence. Linearization of nonlinear dependence by substitution and logarithmization.<br>Random and systematic error of a series of measurements.<br>Complete laboratory work - problem identification, formulation of hypotheses, selection of variables, design of apparatus, data collection and processing, formulation of conclusions, evaluation.<br>Real group computer-aided laboratory experiments focused on the following areas:<br>Hydrostatic compressive force in a liquid, Archimedes' law, Bernoulli's equation for a liquid, resistive force when moving a solid in a liquid, moving a conductor in a magnetic field, moving a magnet in a coil, sound generation, speed of sound propagation, standing waves on a stretched string and on an air column, sound interference). |

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| **Recommended literature:**<br>Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006<br>Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016 |

Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

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

**Notes:**

**Past grade distribution**
Total number of evaluated students: 13

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 0,0 | 7,69 | 30,77 | 15,38 | 0,0 | 46,15 |

**Lecturers:** doc. PaedDr. Viera Haverlíková, PhD.

**Last change:** 16.03.2022

**Approved by:**

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
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| **University:** Comenius University Bratislava |
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| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:** FMFI.KDMFI/1-KXX-013/20 | **Course title:** Laboratory Practicals in Physics (2) |
|---|---|

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

**Number of credits:** 4

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

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

**Learning outcomes:**
Students will develop skills to empirically examine physical phenomena at the level corresponding to the target requirements for the high-school final examination in physics in the areas listed in the brief syllabus.

**Class syllabus:**
Mathematical modeling of real physical situations. Comparison of data obtained by a mathematical model with data from a real experiment.
Video measurement.
Mathematical model and output in the form of interactive animation.
Real group computer-aided laboratory experiments focused on the following areas:
Newton's laws of motion, forces acting on circular motion, inertia, energy of a rotating body, ideal gas phenomena, heat capacity, radiation energy transfer, beam optics, dispersion, interference and diffraction of light, black body radiation.

**Recommended literature:**
Počítačom podporované prírodovedné laboratórium / Peter Demkanin a kol.. Bratislava : Knižničné a edičné centrum, 2006
Physics : Principles with applications / Douglas C. Giancoli. Harlow : Pearson Education, 2016
Fyzika 1 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013
Fyzika 2 / David Halliday, Robert Resnick, Jearl Walker ; redakce českého vydání Petr Dub ; přeložili Miroslav Černý ... [et al.]. Brno : VUTIUM, 2013

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

**Notes:**

| **Past grade distribution** | | | | | |
| Total number of evaluated students: 7 | | | | | |
| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 85,71 | 0,0 | 0,0 | 0,0 | 0,0 | 14,29 |

**Lecturers:** PaedDr. Peter Horváth, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-AIN-406/15 | **Course title:**<br>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.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 111

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 31,53 | 25,23 | 17,12 | 12,61 | 6,31 | 7,21 |

**Lecturers:** doc. PhDr. Ján Rybár, PhD.

**Last change:** 12.01.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** <br> FMFI.KAI/1-AIN-500/00 | **Course title:** <br> Linux for Users |
|---|---|

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

**Number of credits:** 2

**Recommended semester:** 2.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**

**Learning outcomes:**
 The aim of the course is to acquire skills to work on the command line of Linux operating system.
 The course is designed not only for beginners.

**Class syllabus:**
 Text console
 Directories and files
 Users, groups, redirection and searching
 Atributes of files and directories
 Text editor vim
 Sorting and selecting
 Finding
 Processes
 sed - stream editor
 awk
 bash scripts

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 1670

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 43,65 | 15,45 | 13,53 | 10,24 | 11,26 | 5,87 |

**Lecturers:** RNDr. Marek Nagy, PhD.

**Last change:** 22.09.2017

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KEF/1-TEF-311/19 | **Course title:**<br>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:** 4

**Recommended semester:** 7.

**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: 4 | | | | | |
| A | B | C | D | E | FX |
| 25,0 | 0,0 | 25,0 | 25,0 | 25,0 | 0,0 |

**Lecturers:** doc. Ing. Marián Mikula, PhD.

**Last change:** 20.01.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJFB+KTF/1-<br>FYZ-116/17 | **Course title:**<br>Mathematical Methods in Physics (1) |
|---|---|

| |
|---|
| **Educational activities:**<br>  **Type of activities:** lecture / practicals<br>  **Number of hours:**<br>   **per week:** 4 / 2  **per level/semester:** 52 / 26<br>  **Form of the course:** on-site learning |
| **Number of credits:** 6 |
| **Recommended semester:** 3. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Antirequisites:** FMFI.KJFB/1-FYZ-116/15 |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |

**Past grade distribution**
 Total number of evaluated students: 764

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30,24 | 14,53 | 17,41 | 14,14 | 17,02 | 6,68 |

| |
|---|
| **Lecturers:** RNDr. Radoslav Böhm, PhD. |
| **Last change:** |
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJFB+KTF/1-<br>FYZ-117/17 | **Course title:**<br>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:** 6

**Recommended semester:** 4.

**Educational level:** I.

**Prerequisites:**

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

**Course requirements:**

**Learning outcomes:**

**Class syllabus:**

**Recommended literature:**

**Languages necessary to complete the course:**

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 299

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 25,75 | 13,71 | 18,06 | 18,73 | 18,39 | 5,35 |

**Lecturers:** RNDr. Radoslav Böhm, PhD.

**Last change:**

**Approved by:**

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
|---|

| **University:** Comenius University Bratislava |
|---|

| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:**<br>FMFI.KAMŠ/1-TEF-101/19 | **Course title:**<br>Mathematics (1) - Differential and Integral Calculus |
|---|---|

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

| **Number of credits:** 7 |
|---|

| **Recommended semester:** 3. |
|---|

| **Educational level:** I. |
|---|

| **Prerequisites:** |
|---|

| **Course requirements:**<br>Continuous assessment: control tests, midterm exam<br>At least 30% of the points from the continuous assessment are required to be admitted to the final exam.<br>Final examination: written test and oral exam<br>Scale of assessment (preliminary/final): 50/50 |
|---|

| **Learning outcomes:**<br>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:**<br>Review of arithmetic, 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:**<br>K.A. Stroud, D.J Booth, Engineering Mathematics, Industrial Press Inc. New York, 7th Edition |
|---|

| **Languages necessary to complete the course:**<br>Slovak, English |
|---|

| **Notes:** |
|---|

| **Past grade distribution**<br>Total number of evaluated students: 10 |
|---|

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 30,0 | 20,0 | 20,0 | 0,0 | 30,0 | 0,0 |

| **Lecturers:** doc. Mgr. Richard Kollár, PhD. |
|---|
| **Last change:** 13.03.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KAMŠ/1-TEF-102/19 | **Course title:**<br>Mathematics (2) - Differential and Integral Calculus |
|---|---|

**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:** 4.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Continuous assessment: control tests, midterm exam
 At least 30% of the points from the continuous assessment are required to be admitted to the final exam.
 Examination: written, oral
 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:**

**Notes:**

| **Past grade distribution** | | | | | |
| Total number of evaluated students: 7 | | | | | |
| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 28,57 | 28,57 | 14,29 | 28,57 | 0,0 | 0,0 |

**Lecturers:** doc. Mgr. Richard Kollár, PhD.

**Last change:** 13.03.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:** FMFI.KMANM/1-TEF-202/19 | **Course title:** 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:** 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: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20,0 | 0,0 | 20,0 | 60,0 | 0,0 | 0,0 |

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

**Last change:** 01.02.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:** FMFI.KAMŠ/1-TEF-203/20 | **Course title:** 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:** 7.

**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: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20,0 | 0,0 | 40,0 | 20,0 | 20,0 | 0,0 |

**Lecturers:** doc. Mgr. Radoslav Harman, PhD., Pál Somogyi

**Last change:** 02.10.2021

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** FMFI.KJFB+KTF/1-FYZ-111/15 | **Course title:** 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:** 3.

**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: 292

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 14,73 | 12,33 | 8,9 | 6,51 | 20,21 | 37,33 |

**Lecturers:** doc. RNDr. Vladimír Černý, CSc., RNDr. Radoslav Böhm, PhD., Mgr. Peter Maták, PhD., doc. RNDr. Martin Mojžiš, PhD.

**Last change:** 11.04.2017

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJFB+KTF/1-<br>FYZ-112/15 | **Course title:**<br>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:** 4.

**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: 192

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 32,29 | 21,35 | 17,19 | 7,81 | 13,54 | 7,81 |

**Lecturers:** doc. RNDr. Vladimír Černý, CSc., RNDr. Radoslav Böhm, PhD., doc. RNDr. Martin Mojžiš, PhD.

**Last change:** 18.05.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:** FMFI.KAMŠ/1-TEF-201/20 | **Course title:** 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: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20,0 | 60,0 | 20,0 | 0,0 | 0,0 | 0,0 |

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

**Last change:** 01.02.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-TEF-206/19 | **Course title:**<br>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:** 7

**Recommended semester:** 6.

**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: 5 | | | | | |
| A | B | C | D | E | FX |
| 0,0 | 60,0 | 20,0 | 20,0 | 0,0 | 0,0 |

**Lecturers:** prof. RNDr. Peter Markoš, DrSc., Mgr. Pavol Neilinger, PhD.

**Last change:** 27.01.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAFZM/1-TEF-321/19 | **Course title:**<br>Numerical Methods in Physics of Continuum |
|---|---|

| |
|---|
| **Educational activities:**<br>  **Type of activities:** lecture / practicals<br>  **Number of hours:**<br>   **per week:** 2 / 2  **per level/semester:** 26 / 26<br>  **Form of the course:** on-site learning |
| **Number of credits:** 5 |
| **Recommended semester:** 7. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br> 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. Sebastián Ševčík, CSc., doc. RNDr. Peter Guba, PhD. |
| **Last change:** |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KEF/1-TEF-205/19 | **Course title:**<br>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:** 7

**Recommended semester:** 6.

**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: 5 | | | | | |
| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20,0 | 0,0 | 40,0 | 20,0 | 20,0 | 0,0 |
| **Lecturers:** doc. Mgr. Peter Čermák, PhD. | | | | | |
| **Last change:** 27.01.2022 | | | | | |
| **Approved by:** | | | | | |

# COURSE DESCRIPTION

| **Academic year:** 2021/2022 |
|---|

| **University:** Comenius University Bratislava |
|---|

| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:**<br>FMFI.KJFB+KEF/2-<br>FBF-102/00 | **Course title:**<br>Physical Chemistry and Electrochemistry |
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| **Educational activities:**<br> **Type of activities:** lecture<br> **Number of hours:**<br>  **per week:** 2  **per level/semester:** 26<br> **Form of the course:** on-site learning |
|---|

| **Number of credits:** 3 |
|---|

| **Recommended semester:** 7. |
|---|

| **Educational level:** I., II. |
|---|

| **Prerequisites:** |
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| **Course requirements:**<br>Continuous assessment: homework<br>Exam: oral<br>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<br>Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 20/80 |
|---|

| **Learning outcomes:**<br>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:**<br>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:**<br>http://www.chem1.com/acad/webtext/virtualtextbook.html |
|---|

| **Languages necessary to complete the course:** |
|---|

english

**Notes:**

**Past grade distribution**
 Total number of evaluated students: 106

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 60,38 | 32,08 | 4,72 | 0,0 | 0,0 | 2,83 |

**Lecturers:** prof. Ing. Pavel Mach, CSc., prof. RNDr. Ján Urban, DrSc., doc. RNDr. Peter Papp, PhD.

**Last change:** 18.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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|---|---|
| **Course ID:**<br>FMFI.KTV/1-MXX-110/00 | **Course title:**<br>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.

**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: 5698

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 95,35 | 1,7 | 0,12 | 0,0 | 0,07 | 2,76 |

**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, Mgr. Tomáš Lovecký

| **Last change:** 16.06.2022 |
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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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|---|---|
| **Course ID:**<br>FMFI.KTV/1-MXX-120/00 | **Course title:**<br>Physical Education and Sport (2) |

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

| |
|---|
| **Number of credits:** 0 |

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|---|
| **Recommended semester:** 2. |

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|---|
| **Educational level:** I. |

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| **Prerequisites:** |

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| **Course requirements:** |

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|---|
| **Learning outcomes:** |

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|---|
| **Class syllabus:**<br>Practising offensive and defensive combinations and game at modified rules in collective games such as basketball, volleyball, soccer, floorball. Command of elements of higher difficulty in terms of the level of the activity abilities (crawl stroke, breast stroke, butterfly stroke, trampoline jump, aerobic compositions with steps, fitball, elastic gums, paddling on the running water. |

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| **Recommended literature:** |

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

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| **Notes:** |

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|---|
| **Past grade distribution**<br>Total number of evaluated students: 4814 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 96,72 | 1,62 | 0,1 | 0,06 | 0,04 | 1,45 |

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| **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, Mgr. Tomáš Lovecký |

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| **Last change:** 02.06.2015 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KTV/1-MXX-210/00 | **Course title:**<br>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.

**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: 2799

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 98,54 | 0,5 | 0,11 | 0,04 | 0,0 | 0,82 |

**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, Mgr. Tomáš Lovecký

**Last change:** 16.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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

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

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|---|
| **Number of credits:** 2 |

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| **Recommended semester:** 4. |

| |
|---|
| **Educational level:** I. |

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|---|
| **Prerequisites:** |

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| **Course requirements:**<br> Scale of assessment (preliminary/final): 100/0 |

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|---|
| **Learning outcomes:** |

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|---|
| **Class syllabus:**<br> 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. |

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| **Recommended literature:** |

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| **Languages necessary to complete the course:**<br> Slovak, English |

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| **Notes:** |

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| **Past grade distribution**<br> Total number of evaluated students: 2518 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 98,53 | 0,16 | 0,08 | 0,04 | 0,0 | 1,19 |

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| **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, Mgr. Tomáš Lovecký |

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| **Last change:** 15.03.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:** <br> FMFI.KTV/1-MXX-310/00 | **Course title:** <br> Physical Education and Sport (5) |
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| **Educational activities:** <br>  **Type of activities:** practicals <br>  **Number of hours:** <br>   **per week:** 2  **per level/semester:** 26 <br>  **Form of the course:** on-site learning |

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| **Number of credits:** 2 |

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| **Recommended semester:** 5. |

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| **Educational level:** I. |

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| **Prerequisites:** |

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| **Course requirements:** <br>  Scale of assessment (preliminary/final): 100/0 |

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| **Learning outcomes:** |

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| **Class syllabus:** <br>  Preparation and participation of individuals and teams in the system of university sport competitions and sport events. |

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| **Recommended literature:** |

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| **Languages necessary to complete the course:** <br>  Slovak, English |

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| **Notes:** |

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| **Past grade distribution** <br>  Total number of evaluated students: 1864 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 98,98 | 0,38 | 0,11 | 0,0 | 0,0 | 0,54 |

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| **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, Mgr. Tomáš Lovecký |

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| **Last change:** 15.03.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:**<br>FMFI.KTV/1-MXX-320/00 | **Course title:**<br>Physical Education and Sport (6) |
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| **Educational activities:**<br>  **Type of activities:** practicals<br>  **Number of hours:**<br>    **per week:** 2  **per level/semester:** 26<br>  **Form of the course:** on-site learning |

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|---|
| **Number of credits:** 2 |

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| **Recommended semester:** 6. |

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| **Educational level:** I. |

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| **Prerequisites:** |

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| **Course requirements:** |

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| **Learning outcomes:** |

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| **Class syllabus:**<br>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. |

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| **Recommended literature:** |

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

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| **Notes:** |

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| **Past grade distribution**<br>Total number of evaluated students: 1630 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 98,71 | 0,37 | 0,12 | 0,0 | 0,0 | 0,8 |

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| **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, Mgr. Tomáš Lovecký |

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| **Last change:** 02.06.2015 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|
| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

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|---|---|
| **Course ID:**<br>FMFI.KEF/1-OZE-211/15 | **Course title:**<br>Practical I |

**Educational activities:**
 **Type of activities:** laboratory practicals
 **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:**

**Course requirements:**
Continuous assessment: preparation for the practice, writing of reports from individual tasks
Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
Improvement 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 physics research: working with literature, 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 basic physics laws (Gravitational Law, Hooke's Law, Ideal Gas Law,…), quantitative investigation of physical events (state changes, oscillations, polytropic process,…) and measurement of some basic physical quantities (modulus of elasticity, density, viscosity, speed of sound, 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. Evaporation 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 process. 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 allowing measurement and processing of data by computers. For some tasks, conventional measuring instruments and aids are used.

**Recommended literature:**

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

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| **Notes:** | | | | | |
| **Past grade distribution**<br> Total number of evaluated students: 188 | | | | | |
| A | B | C | D | E | FX |
| 61,7 | 18,62 | 13,83 | 2,66 | 1,06 | 2,13 |
| **Lecturers:** doc. RNDr. Juraj Országh, PhD., doc. RNDr. Anna Zahoranová, PhD., doc. Mgr. Dušan Kováčik, PhD., doc. RNDr. Veronika Medvecká, PhD. | | | | | |
| **Last change:** 01.02.2022 | | | | | |
| **Approved by:** | | | | | |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-OZE-212/15 | **Course title:**<br>Practical II |
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| **Educational activities:**<br>  **Type of activities:** laboratory practicals<br>  **Number of hours:**<br>   **per week:** 3  **per level/semester:** 39<br>  **Form of the course:** on-site learning |
| **Number of credits:** 4 |
| **Recommended semester:** 6. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br> Total number of evaluated students: 220 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 45,0 | 33,64 | 15,45 | 1,82 | 0,91 | 3,18 |

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| **Lecturers:** doc. RNDr. Tomáš Roch, Dr. techn., RNDr. Ján Greguš, PhD. |
| **Last change:** 01.02.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJFB+KEF/1-<br>OZE-311/15 | **Course title:**<br>Practical III |
|---|---|

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

**Number of credits:** 4

**Recommended semester:** 7.

**Educational level:** I.

**Prerequisites:**

**Course requirements:**
 Continuous assessment: protocols from completed exercises
 Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
 Scale of assessment (preliminary/final): 100/0

**Learning outcomes:**
 By completing the course, students will gain experimental skills with the used instrumentation. They will make sure of the agreement between experiments and theories that clarify them in the realized experiments.

**Class syllabus:**
 Subjective photometry and light detection, lens imaging, dispersion, properties of optical prism spectrograph, interference, two-beam light interference - Newtonian rings, polarization, sucrose optical activity, refractive index, abbe refractive index measurement by refractometer, light absorption examination, diffraction, Fresnel diffraction of light, Fraunhofer diffraction of light on a slit. Experiments in atomic physics (Franck - Hertz experiment, validation of Stefan-Boltzmann's law, range of alpha particles from Am241 in air), nuclear physics (statistical nature of nuclear processes, determination of gamma ray energy, verification of Compton scattering), applied nuclear physics (measurement of air radioactivity).

**Recommended literature:**
 Fyzikálne praktikum IV : Atómová fyzika a detekcia ionizujúceho žiarenia / Matej Florek ... [et al.]. Bratislava : Univerzita Komenského, 1988
 Instructions can be found here http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm
 Fyzikálne praktikum III : Optika / Zuzana Chorvátová ...[et al.]. Bratislava : Univerzita Komenského, 1984

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

**Notes:**

| **Past grade distribution** | | | | | |
| Total number of evaluated students: 52 | | | | | |
|:---:|:---:|:---:|:---:|:---:|:---:|
| A | B | C | D | E | FX |
| 65,38 | 19,23 | 7,69 | 0,0 | 0,0 | 7,69 |

**Lecturers:** doc. RNDr. Ivan Sýkora, PhD., RNDr. Ján Greguš, PhD., RNDr. Miroslav Ješkovský, PhD.

**Last change:** 01.02.2022

**Approved by:**

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-AIN-130/16 | **Course title:**<br>Programming (1) |
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|---|
| **Educational activities:**<br>  **Type of activities:** lecture / practicals<br>  **Number of hours:**<br>   **per week:** 4 / 4  **per level/semester:** 52 / 52<br>  **Form of the course:** on-site learning |
| **Number of credits:** 9 |
| **Recommended semester:** 3. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Antirequisites:** FMFI.KAI/1-AIN-130/13 |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br> Total number of evaluated students: 974 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 26,8 | 10,57 | 9,45 | 8,62 | 14,37 | 30,18 |

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| **Lecturers:** RNDr. Andrej Blaho, PhD., PaedDr. Daniela Bezáková, PhD., PaedDr. Andrea Hrušecká, PhD. |
| **Last change:** 07.12.2021 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KAI/1-AIN-170/13 | **Course title:**<br>Programming (2) |
|---|---|

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

| |
|---|
| **Number of credits:** 6 |

| |
|---|
| **Recommended semester:** 4. |

| |
|---|
| **Educational level:** I. |

| |
|---|
| **Prerequisites:** FMFI.KAI/1-AIN-130/16 - Programming (1) or FMFI.KAI/1-AIN-130/16 - Programming (1) |

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|---|
| **Course requirements:** |

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| **Learning outcomes:** |

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|---|
| **Class syllabus:** |

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|---|
| **Recommended literature:** |

| |
|---|
| **Languages necessary to complete the course:** |

| |
|---|
| **Notes:** |

**Past grade distribution**
Total number of evaluated students: 1481

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 29,78 | 9,45 | 11,07 | 12,36 | 20,19 | 17,15 |

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|---|
| **Lecturers:** RNDr. Andrej Blaho, PhD. |

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| **Last change:** 08.12.2021 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KTV/1-UXX-340/00 | **Course title:**<br>Recreation Sports in Dialy Routine of Pupils and Students |
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| **Educational activities:**<br>  **Type of activities:** course<br>  **Number of hours:**<br>   **per week:** 2  **per level/semester:** 26<br>  **Form of the course:** on-site learning |
| **Number of credits:** 2 |
| **Recommended semester:** 5. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:**<br>To optimize the daily working programme of the students, the programmes of the sport recreational activities and time-off the students. The sport and health in a value orientation of the students. Using developed elemens in an education physical activity and sport preparation.<br>The programmes of the sport recreational activities as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors as a basic precondition of health strengthening, acquirement of physical capability, fitness, regaining of working energy and readiness of body to confront stress situations and dangerous factors. |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |

| |
|---|
| **Past grade distribution**<br>Total number of evaluated students: 44 |

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

| |
|---|
| **Lecturers:** Mgr. Tomáš Kuchár, PhD. |
| **Last change:** 14.01.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-161/00 | **Course title:**<br>Russian Language (1) |
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| **Educational activities:**<br>  **Type of activities:** practicals<br>  **Number of hours:**<br>   **per week:** 2  **per level/semester:** 26<br> **Form of the course:** on-site learning |
| **Number of credits:** 2 |
| **Recommended semester:** 1. |
| **Educational level:** I., II. |
| **Prerequisites:** |
| **Course requirements:**<br> Scale of assessment (preliminary/final): 100/0 |
| **Learning outcomes:**<br>Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing. |
| **Class syllabus:**<br>To master the fundamentals of general Russian. The language level is A1.<br>Learning the Cyrillic (Russian) alphabet, gaining basic language competence, building up skills and confidence in dealing with unfamiliar authentic and semi-authentic texts.<br>The subject provides a course in Russian language for beginners. |
| **Recommended literature:**<br>The textbook: : Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко). |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br>Total number of evaluated students: 707 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 58,56 | 16,55 | 11,03 | 4,38 | 1,84 | 7,64 |

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| **Lecturers:** Viktoria Mirsalova |
| **Last change:** 20.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:**<br>FMFI.KJP/1-MXX-162/00 | **Course title:**<br>Russian Language (2) |
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| **Educational activities:**<br> **Type of activities:** practicals<br> **Number of hours:**<br>  **per week:** 2  **per level/semester:** 26<br> **Form of the course:** on-site learning |

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| **Number of credits:** 2 |

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| **Recommended semester:** 2. |

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

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| **Prerequisites:** |

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| **Course requirements:**<br> Scale of assessment (preliminary/final): 100/0 |

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| **Learning outcomes:**<br> Basic communication in Russian, developing other Russian language skills - listening comprehension, reading and writing. |

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

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| **Recommended literature:**<br> Textbook: Точка Ру А1 (Ольга Долматова, Екатерина Новачац), pracovné karty Падежи 1 (Л.С. Безкоровайная, В.Е. Штыленко). |

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

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| **Notes:** |

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| **Past grade distribution**<br> Total number of evaluated students: 421 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 65,08 | 15,68 | 8,79 | 3,8 | 0,95 | 5,7 |

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| **Lecturers:** Viktoria Mirsalova |

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| **Last change:** 20.06.2022 |

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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-261/00 | **Course title:**<br>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., 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: 200

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 70,5 | 17,5 | 8,5 | 2,5 | 0,0 | 1,0 |

**Lecturers:** Viktoria Mirsalova

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-262/00 | **Course title:**<br>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., 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 А2 (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: 144

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 75,69 | 13,19 | 6,94 | 2,78 | 0,69 | 0,69 |

**Lecturers:** Viktoria Mirsalova

**Last change:** 20.06.2022

**Approved by:**

# COURSE DESCRIPTION

| Academic year: 2021/2022 | |
|---|---|
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |
| **Course ID:**<br>FMFI.KAI/2-IKVa-192/19 | **Course title:**<br>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., 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: 48

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 56,25 | 18,75 | 6,25 | 6,25 | 6,25 | 6,25 |

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

**Last change:** 28.02.2020

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KMANM/1-<br>MAT-715/15 | **Course title:**<br>Seminar in MS-Office |
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| **Educational activities:**<br>  **Type of activities:** seminar<br>  **Number of hours:**<br>    **per week:** 2  **per level/semester:** 26<br>  **Form of the course:** on-site learning |
| **Number of credits:** 2 |
| **Recommended semester:** 2. |
| **Educational level:** I. |
| **Prerequisites:** |
| **Antirequisites:** FMFI.KMANM/1-MAT-715/00 |
| **Course requirements:** |
| **Learning outcomes:** |
| **Class syllabus:** |
| **Recommended literature:** |
| **Languages necessary to complete the course:** |
| **Notes:** |
| **Past grade distribution**<br> Total number of evaluated students: 143 |

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 57,34 | 15,38 | 6,99 | 6,99 | 4,9 | 8,39 |

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| **Lecturers:** RNDr. Peter Švaňa, CSc. |
| **Last change:** 02.06.2015 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KMANM/1-<br>MAT-770/15 | **Course title:**<br>Seminar in TEX |
|---|---|

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

**Number of credits:** 2

**Recommended semester:** 1.

**Educational level:** I.

**Prerequisites:**

**Antirequisites:** FMFI.KMANM/1-MAT-770/00

**Course requirements:**
 Ongoing assessment: 10 individual tasks 5 points each
 Exam: individual work, rewriting the specified text for 50 points
 Indicative assessment scale: A 90%, B 80%, C 70%, D 60%, E 50%
 Scale of assessment (preliminary/final): 50/50

**Learning outcomes:**
 Mastering the MikTeX or LaTeX compiler for writing professional texts. Introduction to editors
 for creating such texts.

**Class syllabus:**
 1. Visualization of a tex file, error messages
 2. Basic structure of a tex file, commands and environments, organization of different types of
 documents
 3. Styles and font sizes, tables writing, footnotes
 4. Mathematical formulas, creating simple pictures and inserting external pictures
 5. Literature writing, index creation, slides
 6. Creation of special documents (presentation, letter, ...)

**Recommended literature:**
 Teacher's own electronic texts published through web documents.

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

**Notes:**

| Past grade distribution | | | | | |
|---|---|---|---|---|---|
| Total number of evaluated students: 415 | | | | | |
| A | B | C | D | E | FX |
| 84,34 | 5,3 | 3,61 | 1,69 | 1,2 | 3,86 |

**Lecturers:** RNDr. Michal Pospíšil, PhD.

**Last change:** 17.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-171/20 | **Course title:**<br>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., II.

**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: 23

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 47,83 | 0,0 | 0,0 | 0,0 | 0,0 | 52,17 |

**Lecturers:** Mgr. Aneta Barnes

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KJP/1-MXX-172/20 | **Course title:**<br>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., II.

**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: 22

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 81,82 | 0,0 | 4,55 | 0,0 | 0,0 | 13,64 |

**Lecturers:** Mgr. Aneta Barnes

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:** FMFI.KJP/1-MXX-271/20 | **Course title:** 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., II.

**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: 8

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

**Lecturers:** Mgr. Aneta Barnes

**Last change:** 21.06.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

| **University:** Comenius University Bratislava |
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| **Faculty:** Faculty of Mathematics, Physics and Informatics |
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| **Course ID:**<br>FMFI.KJP/1-MXX-272/20 | **Course title:**<br>Slovak Language for Foreign Students (4) |
|---|---|

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

| **Recommended semester:** 4. |
|---|

| **Educational level:** I., II. |
|---|

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

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

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

| **Recommended literature:**<br> Krížom-Krážom Slovenčina 2, additional material to further support the covered topics. |
|---|

| **Languages necessary to complete the course:** |
|---|

| **Notes:** |
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| **Past grade distribution**<br> Total number of evaluated students: 7 |
|---|

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

| **Lecturers:** Mgr. Aneta Barnes |
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| **Last change:** 21.06.2022 |
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| **Approved by:** |
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# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KMANM/1-<br>MAT-733/19 | **Course title:**<br>Software MATLAB |
|---|---|

**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., II.

**Prerequisites:**

**Antirequisites:** FMFI.KMANM/1-MAT-731/00 and FMFI.KMANM/1-MAT-732/00

**Course requirements:**
 Continuous assessment: activity
 Examination: group project, practical computer exam
 Scale of assessment (preliminary/final): 20/80

**Learning outcomes:**
Students will learn the basics of using MATLAB software. They will be able to use MATLAB to calculate some mathematical problems, read files or write to files, plot computed data, create complex functions for reuse and create a graphical user interface GUI for their programs.

**Class syllabus:**
 Format and conversion of variables, vectors and matrices
 Programming environment, so-called M-file
 Reading from a file and protting data
 Creating functions
 Graphical GUI environment

**Recommended literature:**
 MATLAB - SIMULINK I / Stefan Kozak, Slavomir Kajan. Bratislava: Slovak University of Technology, 1999 Matlab / Jela Babušíková. Bratislava: FMFI UK Library and Publishing Center, 2007
 Kozák Š., Kajan S., Matlab - Simulink, 1. Slovak University of Technology in Bratislava, 1999. ISBN Dušek F., MatLab and Simulink, University of Pardubice, 2000
 mathworks.com/help

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

**Notes:**

**Past grade distribution**
  Total number of evaluated students: 52

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 19,23 | 25,0 | 13,46 | 15,38 | 11,54 | 15,38 |

**Lecturers:** RNDr. Patrik Mihala, PhD.

**Last change:** 15.03.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KTV/1-MXX-115/15 | **Course title:**<br>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.

**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: 227

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 99,56 | 0,0 | 0,44 | 0,0 | 0,0 | 0,0 |

**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.

| Last change: 16.06.2022 |
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| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KTV/1-MXX-215/15 | **Course title:**<br>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.

**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: 194

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 94,33 | 0,0 | 0,0 | 0,0 | 0,0 | 5,67 |

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| **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. |
| **Last change:** 16.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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| **University:** Comenius University Bratislava |

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| **Faculty:** Faculty of Mathematics, Physics and Informatics |

| **Course ID:** FMFI.KTV/1-MXX-216/18 | **Course title:** Sports in Nature (3) |
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| **Educational activities:** |
|  **Type of activities:** |
|  **Number of hours:** |
|   **per week:**  **per level/semester:** |
|  **Form of the course:** on-site learning |

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| **Number of credits:** 1 |

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| **Recommended semester:** 3. |

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| **Educational level:** I. |

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| **Prerequisites:** |

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

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| **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. |

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| **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. |

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| **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. |

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| **Recommended literature:** |

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

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| **Notes:** |
| KTVŠ does not rent ski equipment. |

**Past grade distribution**
Total number of evaluated students: 19

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

| **Lecturers:** Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, PaedDr. Mikuláš Ortutay, Mgr. Júlia Raábová, PhD. |
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| **Last change:** 16.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KTV/1-MXX-217/18 | **Course title:**<br>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.

**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: 18

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 88,89 | 0,0 | 0,0 | 0,0 | 0,0 | 11,11 |

| **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. |
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| **Last change:** 16.06.2022 |
| **Approved by:** |

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KEF/1-TEF-301/19 | **Course title:**<br>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:** 7

**Recommended semester:** 7.

**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: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 20,0 | 20,0 | 20,0 | 20,0 | 20,0 | 0,0 |

**Lecturers:** doc. RNDr. Martin Moško, DrSc.

**Last change:** 01.02.2022

**Approved by:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-133/18 | **Course title:**<br>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.

**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: 25

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 52,0 | 24,0 | 8,0 | 0,0 | 8,0 | 8,0 |

**Lecturers:** Mgr. Ing. Jana Kočvarová

| **Last change:** 17.06.2022 |
|---|
| **Approved by:** |

# COURSE DESCRIPTION

| | |
|---|---|
| **Academic year:** 2021/2022 | |

**University:** Comenius University Bratislava

**Faculty:** Faculty of Mathematics, Physics and Informatics

| **Course ID:**<br>FMFI.KJP/1-MXX-134/18 | **Course title:**<br>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.

**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: 26

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 57,69 | 15,38 | 0,0 | 11,54 | 3,85 | 11,54 |

**Lecturers:** Mgr. Ing. Jana Kočvarová

**Last change:** 17.06.2022

**Approved by:**

# STATE EXAM DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |
| **University:** Comenius University Bratislava | |
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |
| **Course ID:**<br>FMFI.KEF/1-TEF-951/19 | **Course title:**<br>Technical Physics |
| **Number of credits:** 4 | |
| **Recommended semester:** 7., 8.. | |
| **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:**

# COURSE DESCRIPTION

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|---|---|
| **Academic year:** 2021/2022 | |

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|---|---|
| **University:** Comenius University Bratislava | |

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|---|---|
| **Faculty:** Faculty of Mathematics, Physics and Informatics | |

| **Course ID:**<br>FMFI.KEF/1-TEF-211/19 | **Course title:**<br>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:** 6.

**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: 5

| A | B | C | D | E | FX |
|---|---|---|---|---|---|
| 40,0 | 20,0 | 20,0 | 20,0 | 0,0 | 0,0 |

**Lecturers:** prof. RNDr. Peter Markoš, DrSc., Ing. Ján Janošovský, PhD.

**Last change:** 17.02.2022

**Approved by:**