Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KVSBOT	**Title of Course: General botany**
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, laboratory exams **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 50 hours Guided work: 10 hours	
Number of credits: 3	
Semester: 1st semester	
Degree/Level: 1st degree 1 (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Exam. (a) mid-term examination: Active participation in exercises, elaboration of separate protocols from laboratory exercises, collections of dried pressed leaves and dried fruits (20 + 20 pieces) collected in our latitudes and successful completion of continuous tests (two tests) with a minimum success rate of 60%. Successful completion of the mid-term examination is a condition for the final exam. (b) final examination: Successful completion of the final exam - test from the lectured curriculum, knowledge gained by completing exercises and self-study. Success criteria: A: 100.00 - 90.00%; B: 89.99 - 80.00%; C: 79.99 - 70.00%; D: 69.99 - 60.00%; E: 59.99 - 50.00%; FX: 49.99 and less %.	
Aims and Objectives: **Knowledge gained:** The student: - can define basic concepts from the field of general botany; - can identify the characteristics of a plant cell and plant tissue; - can describe the internal and external structure of individual parts of the plant body; - can determine the basic shapes of plant organs; - can explain anatomical and morphological differences, functions, meaning of individual parts of the plant body and their metamorphosis. **Skills Acquired:** The student: - can interpret the acquired knowledge in his own words; - can apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context; - can prepare, solve and present study outputs (assignments, projects, protocols, collections) independently, but also collectively, and justify the correctness of their content; - can think critically, formulate own conclusions and defend them. **Acquired competences:** The student:	

- can apply acquired knowledge and skills;
- can solve professional tasks;
- knows how to coordinate partial activities and work collectively;
- can take responsibility for the tasks and results of his work.

Syllabus/Indicative Content:

- Introduction to plant cytology - plant cell and its structure.
- Introduction to the histology of plant tissues - classification, characteristics and meaning.
- Introduction to plant organology:
  - Root anatomy and morphology, functions and significance.
  - Anatomy and morphology of the stem, functions and meaning.
  - Anatomy and morphology of the leaf, functions and meaning.
  - Anatomy and morphology of the shoot, functions and significance.
  - Anatomy and morphology of the flower, functions and meaning.
  - Mechanisms of pollination and fertilization of plants and the formation of seeds and fruits.
  - Anatomy and morphology of the seed and fetus, functions and meaning.
  - Germination, growth and life cycle of plants.

Suggested readings:

BOBÁK, M. a kol. Botanika - anatómia a morfológia rastlín. SPN Bratislava. 1992.
NOVÁK, J. a SKALICKÝ, M. Botanika. Powerprint Praha 2017.
VINTER, V. a HAŠLER, P.: Praktikum z anatomie vyšších rastlín. Univerzita Palackého v Olomouci. 1. vydanie. 2018.
VOTRUBOVÁ, O.: Anatomie rostlin. Praha: Nakladatelství Karolinum UK, 2010.
SLAVÍKOVÁ Z.: Morfologie rostlin. Praha: Nakladatelství Karolinum, 2002.
LUX, A. a kol. Praktikum z anatómie a morfológie rastlín. UK Bratislava, 1998.
CURTIS J. D. et al: Photographic Atlas of Plant Anatomy dostupné na: https://botweb.uwsp.edu/Anatomy/
Lecture documents

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Vincent Sedlák, PhD., guarantor, lecturer, examiner
RNDr. Michaela Zigová, PhD., examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KCYTOL	**Title of Course: Cytology and histology**
Type, scope and method of educational activities: Compulsory course **Form of Study:** lecture, laboratory exercise **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 50 hours Guided work: 10 hours	
Number of credits: 3	
Semester: 1th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Conditions for passing the course: Exam Active participation in lectures and exercises is mandatory for successful completion of the course. A student may have a maximum of 2 absences during the semester, excused on the basis of a medical certificate. Absences are compensated by the student; the form of compensation is determined by the teacher. Credits will not be granted to the student in the event of a large number of absences or unexcused absences. During the semester, there will be continuous evaluations at the exercises. The final exam is conditional on successful semester mid-term examinations. The final exam will be oral (the teacher must notify the students in advance of the change in the form of the exam). The final exam will consist of lectures, exercises and recommended literature. Evaluation criteria: A: 100.00 - 90.00%, B: 89.99 - 80.00%, C: 79.99% - 70.00%, D: 69.99% - 60.00%, E : 59.99% - 50.00%. FX: 49.99% and less.	
Aims and Objectives: **Acquired knowledge:** The student will be able to: - define and describe basic concepts in the subject of cytology and histology; - define and determine the cell and its individual structures, - explain the differences between prokaryotic and eukaryotic, plant and animal cells, - characterize individual cell organelles, - describe the processes taking place in cells - apply knowledge and skills about the basic histological structure of tissues in the organism; - describe and understand the histogenesis and differentiation of epithelial, connective, muscle and nervous tissue; - describe the morphology, function and phylogenetic connections of tissues. **Acquired skills:** The student will be able to: - actively acquire new informations from the field of cytology and histology, - apply acquired skills in microscopic observation of cells, - process the necessary material of plant and animal origin and create temporary preparations of cells,	

- work with a microscope when observing permanent preparations;
- apply acquired knowledge in an interdisciplinary manner.

Acquired competences:

The student will be able to:
- use the developed competences for further self-education;
- can communicate responsibly, make decisions and adapt flexibly according to given conditions,
- actively acquire new informations from the field of cytology and histology;
- also use developed intellectual competences that allow him to continue further studies.

Syllabus/Indicative Content:

Levels of organization of living systems. Comparison of prokaryotic and eukaryotic cells, basic differences between plant and animal cells. Cell and nucleus morphology and size. Cytoplasmic membrane - structure, Mitochondria, Endoplasmic reticulum, Golgi complex, Cell inclusions, Basic methods of cell division. Pathobiology of the cell. Life cycle of a cell, Animal cell as an independent living individual.
Differentiation of tissues from germ leaf during embryogenesis. General characteristics of tissues. Epithelial tissues. Connective tissues - ligaments, cartilage, bone. Trophic tissues. Muscle tissues. Nervous tissue. Evaluation based on a written test and recognition of histological preparations.

Recommended reading:

Vajner, L. et al: Lekárska histologie, Cytologie a obecná histologie, (Vyd. Karolinum), 2010, 110s. ISBN: 9788024618609
Konrádová, V. et al: Histologie - prednášky pro bakal. štúdium, (Vyd.HaH), 2005, 186s. ISBN: 8073190095
Martinek, J., Vacek, Z.: Histologický atlas, (Vyd. Grada), 2009, 80s. ISBN: 9788024723938
Wotke, J. et al.: Histopatologické praktikum (Vyd. Epawa), 2002, 316s. ISBN: 978-80-8629-709-5.
Bobák, M. a kol. (1986): Cytológia – učebnica pre prírodov. fakulty, Vyd.: Osveta, Martin.
Kapeller, K., Strokele, H. (1990): Cytomorfológia. Osveta, Martin.
Bobák, M. Šamaj, J. (2002): Cytológia. UK, Bratislava.

Language of Instruction: Slovak language

Other course information: -

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Iveta Boroňová,PhD. - lecturer, examiner, leader of exercises
doc.MVDr.Soňa Mačeková,PhD. - lecturer, examiner, leader of exercises
RNDr. Jana Gaľová, PhD. - examiner, leader of exercises

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/CHEMVYP	**Title of Course:** Chemical calculations 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** Practical seminar **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - will know basic chemical laws used in chemical calculations; - will know basic gas laws for their use in chemical calculations; - acquires knowledge about the occurrence, preparation, production, physical and chemical properties of selected chemical elements; Acquired skills: Student: - can describe the equations of chemical reactions; - can perform chemical calculations based on gas laws and chemical reaction equations; - can calculate the concentrations of chemical solutions. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content:	

Basic physical constants and quantities important for chemical calculations. Rounding the results of chemical calculations. Stoichiometric calculations. Calculations using ideal gas laws. Calculations related to solutions and solubility of substances. Combined calculations.

Suggested readings:

1. Tatiersky, J.: Základné chemické výpočty. 3. vyd. Bratislava: Univerzita Komenského, 2021.
2. Ulická, Ľ., Ulický, L.: Príklady zo všeobecnej a anorganickej chémie. Bratislava/Praha: Alfa/SNTL, 1987.
3. Langfelderová, H. a i.: Anorganická chémia: príklady a úlohy v anorganickej chémii. Bratislava: Alfa, 1990.

Language of Instruction: Slovak

Other course information:

Grading history:

50 students

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

Doc. Ruslan Mariychuk, CSc. - seminars
RNDr. Romana Smolková, PhD. - seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/VSCHEM	**Title of Course:** General chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 120 hours **Direct education:** 20 hours **Self-study:** 80 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 4	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): *Success criteria (percentage):* *a) A - 100.00 - 90.00%* *b) B - 89.99 - 80.00%* *c) C - 79.99 - 70.00%* *d) D - 69.99 - 60.00%* *e) E - 59.99 - 50.00%* *f) FX - 49.99 and less%.* **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: Acquired knowledge: Student: - will master basic chemical terminology and laws; - acquires knowledge about the structure of the atom; - will be oriented in the types of chemical bonds and types of chemical reactions; - will acquire knowledge of basic chemical concepts necessary for successful study of individual fields of chemistry. Acquired skills: Student: - will master nomenclature, relationships between quantities; - will be able to write down and read chemical reactions; - will master basic chemical calculations. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.;	

- acquires professional competences within his field.

Syllabus/Indicative Content:
Atom. Quantum numbers. Electron configurations of atoms and ions. Periodic table of elements. Chemical bond. Bond polarity, molecule polarity, substance polarity. Supramolecular interactions. Electronic structural formulas. Structure of molecules and ions. Valence shell electron pair repulsion theory. Basic concepts of coordination chemistry. Group states and transformations of substances. Blends. Electrolytic dissociation. Osmosis. Chemical reactions, chemical equations. Basics of chemical thermodynamics and kinetics. Equilibrium constants. Acids and bases. Hydrolysis. Redox reactions. Precipitation reactions.

Suggested readings:
1. Gažo J. a kol.: Všeobecná a anorganická chémia, Alfa, Bratislava 1981.
2. P. Atkins: Fyzikála chémia STU Bratislava 1999
3. Žúrková, Ľ. a kol.: Všeobecná chémia. 1. vyd. Bratislava : SPN, 1985.
4. Tatiersky, J.: Základné chemické výpočty. 3. vyd. Bratislava: Univerzita Komenského, 2021.
6. Atkins P.P.W.: General Chemistry, Scientific Amer Incorporated, 1992

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
Doc. Ruslan Mariychuk, CSc. - lectures
RNDr. Romana Smolková, PhD. - lectures

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/LABTECH	**Title of Course:** Laboratory technics
Type, scope and method of educational activities: Compulsory subject **Form of Study:** Laboratory exercises **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - acquires important knowledge about work safety in a chemical laboratory; - acquires knowledge about the effects and labeling of chemical substances; - acquires knowledge of providing first aid; - will know the name and purpose of basic laboratory aids. Acquired skills: Student: - will be able to use laboratory aids; - will acquire skills in basic laboratory operations. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content: Basics of work safety in the laboratory, labeling of chemical substances and their effects, principles of first aid. Materials used in the chemical laboratory. Measurement of weight,	

volume and determination of density of metal and liquid. Dissolution, preparation of a saturated solution, solubility and determining the effect of temperature on the solubility of substances. Preparation of insoluble substances, decantation, filtration and drying. Working with glass, temperature measurement, heating, cooling, phase changes. Working with gases, their preparation and purification. Separation of mixtures using distillation and extraction. Sublimation of substances and work with non-aqueous solvents. Purification of a solid by means of recrystallization and various methods of crystallization. Preparation of solutions, acid-base indicators, pipetting and titration determination of the concentration of a substance in a solution. Work with ion exchangers. Determination of water content in crystal hydrates.

Suggested readings:

1. Gažo J. a kol.: Všeobecná a anorganická chémia, Alfa, Bratislava 1981.
2. Tatiersky, J.: Základné chemické výpočty. 3. vyd. Bratislava: UK, 2021.
3. Laboratórne cvičenia z chémie pre nechemické odbory/ Smolková R., Mariychuk R. - Prešov: Prešovská univerzita v Prešove, 2022. - 157 s. - ISBN 978-80-555-3028-4.
4. Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 3. vyd. Bratislava : Univerzita Komenského, 2006.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

Doc. Ruslan Mariychuk, CSc. - laboratory exercises
doc. RNDr. Daniela Gruľová, PhD. - laboratory exercises
RNDr. Romana Smolková, PhD. - laboratory exercises

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMECHA	**Title of Course:** General Physics - Mechanics
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exercise **Number of contact hours:** 3/1 **per week:** 3/1 **per level/semester:** 39/13 **Student workload:** 120 hours **Direct education:** 40 hours **Self-study:** 30 hours **Tasks training:** 30 hours **Tasks solving:** 10 hours **Presentation preparation:** 10 hours **Study method:** combined	
Number of credits: 4	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: Acquired knowledge: - correctly understand the basic knowledge of the mechanical movement of a mass point and a rigid body from the point of view of kinematics and dynamics - correctly understand the basic concepts of hydrostatics and hydrodynamics - apply the basic equations for the movement of bodies in the gravitational field, in liquids and gases - use the basics of vector calculus and mathematical analysis (at a level appropriate for the 1st semester) when solving physics problems Acquired skills: - apply the laws of physical phenomena and their connections when solving examples - to understand the intersubject relationships of these phenomena and their links to other technical disciplines - apply knowledge from general physics when solving examples and during laboratory work in Basic Practice 1 - apply knowledge from general physics 1 when creating preparations for lessons during pedagogical practice Acquired competences: - Competences related to learning outcomes;	

- Professional-subject competences – physics teacher as a guarantor of conveying scientific foundations through the application of modern progressive methods;
- Organizational and management competences – a teacher able to plan his activities;
- Diagnostic and intervention competences – a teacher able to diagnose the problem of his students;
- Competences of reflection of one's own activity – a teacher capable of reflecting, evaluating and modifying one's own educational activities.

Syllabus/Indicative Content:

- Dynamics of a mass point
- Newton's dynamic laws, force, momentum. Solution of the equation of motion. Movement in a hostile environment. Inertial and non-inertial coordinate systems. Coriolis and centrifugal force. Conservation laws, work, kinetic and potential energy
- Gravitational field
- Kepler's laws. Newton's law of gravity, movements in the gravitational field. First and second cosmic velocity
- Fundamentals of the mechanics of a system of mass points – the first and second impulse theorems, mechanics of a rigid body, moment of momentum
- Deformation of solids, Hooke's law, modulus of elasticity
- Fluid mechanics from the point of view of kinematics, statics and dynamics
- Equation of hydrostatic balance, equation of continuity
- Bernoulli's equation.

Suggested readings:

1. HLAVIČKA, A.: Fyzika pre pedagogické fakulty 1.Praha 1978
2. HAJKO, V. SZABÓ,J.,D. : Základy fyziky. Veda, Bratislava 1980
3. KVASNICA, J. a kol. : Mechanika. Academia, Praha 1988
4. VEIS, Š. a kol. : Všeobecná fyzika 1. Alfa 1978

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: RNDr. Ivan Čurlík, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KSPEC1	**Title of Course:** Special practicum of physics 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** exercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester:** 0/13 **Student workload:** 30 hours **Direct education:** 20 hours **Self-study:** 10 hours **Study method:** combined	
Number of credits: 1	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): During the semester, checking the knowledge that the student has studied. Independent work is focused on experimental activities with various devices and devices, with which students verify their experimental skills. The content of the project is the presentation of the measurement preparation. measurement methods such as Gradual, group, interpolation method. The method of least squares. Measurement errors. Sources of errors. Types of errors. Systematic errors. Random errors of direct measurements. Statistical processing of measurement results. Computational methods of processing measurement results. Graphical methods of processing measurement results. The seminar work will be developed on a specific selected topic. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation	
Aims and Objectives: General knowledge: - define and freely interpret in basic terms and definitions from the field of general physics and relationships between individual physical quantities; - interpret safety regulations and health protection when working in a physics laboratory; - describe the procedure of the experimental activity; - apply the measured results when preparing the laboratory protocol and in class; - process the results of measurements of individual physical quantities; - process and statistically evaluate the results of individual measurements of physical quantities. **Professional knowledge:** - process and statistically evaluate the results of individual measurements of physical quantities;	

- describe and classify measurement methods and propose their application in individual experiments;
- express conclusions in your own words, explain and justify the importance of experimental activity within the teaching process;
- discuss and justify the effectiveness of the measurement in terms of the planned educational goals.

Cognitive skills:

- discuss and justify the effectiveness of the measurement in terms of the planned educational goals.
- characterize, classify didactic means (teaching aids and didactic technique) necessary for individual experiments;

Practical skills:

- classify experiments and propose possibilities of their application in teaching physics;
- present the designed experiment in the lesson in the group - micro-presentation.

Syllabus/Indicative Content:

Principles and legislation of occupational safety in the physical laboratory. The role of experiment in the process of physical cognition. Physical quantities and units. Older systems of units . International System of Units SI. Measurement of physical quantities. Preparation of measurement. Methods of measurement. Sequential, group, interpolation method. Least squares method. Measurement errors. Sources of errors. Types of errors. Systematic errors. Random errors of direct measurements. Statistical treatment of measurement results. Computational methods for processing measurement results. Graphical methods for processing measurement results. Basic measuring instruments and measurement procedure in mechanics and molecular physics. Basic measuring instruments and measurement procedure in electricity and magnetism. Basic measuring instruments and measurement procedure in optics. Basic measuring instruments and measurement procedure in atomistics and nuclear physics. Methodology of processing a physical measurement protocol.

Suggested readings:

1. Brož, J. a kol.: Základy fyzikálních měření I., Praha, SPN 1983
2. Lehotský, D.: Praktikum z fyziky pre PF, Bratislava, SPN 1967
3. Tarabčáková, E.: Úvod do praktických cvičení z fyziky, skriptá PF UPJŠ Košice 1977
4. Morvay, L., Koubek, V.: Laboratórne úlohy z fyziky, Bratislava, SPN 1970
5. Šindelář, V., Smrž, L.: Nová soustava jednotek, SPN Praha 1989
6. Koubek, V. a kol.: Školské pokusy z fyziky, Bratislava, SPN 1992

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Dr. h. c. doc. PaedDr. Vladimír Šebeň, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMAPR1	**Title of Course:** Mathematics for natural scientists 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** exercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester:** 0/13 **Student workload:** 60 hours **Direct education:** 10 hours **Self-study:** 40 hours **Home tasks elaboration:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 1.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: Acquired knowledge: A graduate of this subject can: - understand concepts such as function, variables, domain of definition and domain of values - understand the meaning of sets and graphs - learn algorithms for solving equations of several types - understand the meaning of the limit of a function, the derivative of a function and the integral of a function - understand the relationship function - derived function, function - primitive function - to learn selected methods of finding the derivative of functions and primitive functions Acquired skills: A graduate of this subject can: - use algorithms for solving equations of several types - apply acquired mathematical skills in solving natural science problems Acquired competences: A graduate of this subject can:	

- determine the type of task and propose a solution procedure
- solve natural science problems using the acquired mathematical apparatus
- connect mathematical skills from different areas of natural sciences

Syllabus/Indicative Content:

- Concept of function of real variable, rational, irrational function
- Graph of the function, dependent and independent variable
- Solving linear, quadratic equations
- Solving logarithmic, exponential, trigonometric equations
- Limit of a function, derivative of a function - its physical and geometric meaning
- Rules for calculating the derivative, studying the course of a function using the derivative
- Integral number of a function of one variable - primitive function, indefinite integral, properties of integrals, methods of integration
- definite integral – properties and calculation

Suggested readings:

1. Brajerčík, J., Demko, M.: Matematika pre študentov prírodovedných odborov (biológia-ekológia-geografia), 1. časť. Elektronický učebný text. Prešovská univerzita v Prešove, 2018
2. Brajerčík J., Majherová M., Litecká J.: Matematika pre študentov prírodovedných odborov 2. Časť (Biológia - Ekológia - Fyzika - Geografia - Technika), Elektronický učebný text. Prešovská univerzita v Prešove, 2023
3. Hecht T., Sklenáriková Z.: Metódy riešenia matematických úloh, SPN, Bratislava 1992
4. Kvasnica J. Matematický aparát fyziky Praha, Academia 1989
5. Grega A. a kol.: Matematika pre fyzikov, Slov. ped. nakladateľstvo, Bratislava 1974
6. Andrejiová, M., Kimáková, Z.: Matematika 1, Technická univerzita v Košiciach, 2020.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KVSEZO	**Title of Course: General zoology**
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exams **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Study method:** combined **Student workload: 90 hours** Direct education: 20 hours Self-study: 60 hours Guided work: 10 hours	
Number of credits: 3	
Semester: 2nd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Exam. Intermediate control of studies (intermediate test) 25 %; preparation of seminar project and protocols 25 %, final written test 50 %. Active participation in lectures and seminars is mandatory for successful completion of the course. A student may have a maximum of 1 absence during the semester, excused based on a medical certificate. In case of more absences, the student will not be awarded credit. In seminars, a seminar project on a predetermined topic must be prepared and presented in 15-20 minutes. The assessment of the course will result in a written examination within the scope of the lectures. **Grading Criteria**: A: 100-91%; B: 90.0-81.0; C: 80.0-71.0; D: 70.0-61.0%; E: 60.0-51.0; Fx: 50.0% or less.	
Aims and Objectives: **Knowledge gained:** The student: - can define the basic concepts of morphology of multicellular animals; - can characterize the structure and function of tissues, organ systems with respect to their ontogeny and phylogeny; - can demonstrate knowledge and understanding in their field of study. **Skills Acquired:** The student: - can apply the knowledge acquired by observing permanent specimens of individual tissues or organs of animals; - can work independently and in a group with a microscope and laboratory equipment. **Acquired competences:** The student: - has developed the skills to learn, necessary to continue further studies with a high degree of independence;	

- is able to apply the acquired knowledge, demonstrating a professional approach to work;
- can communicate effectively with pupils, parents, teachers and professionals;
- can define problems and determine the possibilities of solving them; is able to make compromises; is able to create a positive classroom climate and establish good social relations in the classroom.

Syllabus/Indicative Content:

- Symmetry of animals.
- Organ, organ system and organ types. Rudimentary organs. Homotypic organs, homodynamic organs. Homologous and analogous organs.
- Body covering - tegmentum. Surface organelles of Monocytozoa (unicellular). Body covering of Polycytozoa (multicellular). Integument derivatives.
- Support system- ectoskeleton, endoskeleton.
- Muscular system.
- Digestive system. Digestive organelles of unicellulars, digestive system of multicellulars.
- Respiratory system.
- Vascular system. Structure of the heart. E
- Excretory system.
- Sensory organs. Mechanoreceptors. Chemoreceptors. Photoreceptors.
- Nervous system.
- Endocrine system.
- Reproductive system: gonads of hermaphrodites, gonochorists.
- Direct and indirect development. Animal larvae.

The knowledge from the above-mentioned subject is necessary for the study of other basic subjects: zoology of non-chordates and zoology of chordates

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Suggested readings:

Bocáková M.: Obecná zoologie pro učitele. Vyd. UP v Olomouci, 2009, 77s . ISBN 978 -80-244-2275-6

Csanády, A.: Výkladový a obrazový slovník z morfológie živočíchov. Prešovská univerzita. Prešov 2021, 136 s. ISBN 978-80-5552533-4,

Dostupné z: http://www.pulib.sk/web/kniznica/elpub/dokument/Csanady4 Malina R.: Všeobecná zoológia. FPV, BB, 2004. 95 s.

Majzlan, O. Glváč, M.: Zoológia, 2002, 275 s. ISBN 80-968535-4-6. / iba obecná časť/ Mock, A.: Úvod do porovnávacej morfológie živočíchov. Vysokoškolský učebný text.

Univerzita Pavla Jozefa Šafárika v Košiciach. Košice. 2019, 149s. ISBN 978-80-8152-826-2,

Dostupné z: https://unibook.upjs.sk/sk/prirodovedecka-fakulta/1278-uvod-do-porovnavacej-morfologie-zivocichov Roček, Z. (1998). Obecná morfologie živočichů. Univerzita Karlova. Praha. 1998,

Dostupné z: http://rocek.gli.cas.cz/Courses/courses.html

Trnka, A.: Chordáty. Zoológia a ekológia. Trnavská univerzita. Trnava. 2008. 223 s. ISBN 9788080822446.

Trnka, A.: Všeobecná zoológia. II. Organológia. Trnava. 2017, 84 s. ISBN 978-80-568-0071-3

Trnka, A.: Zoológia chordátov. Vybrané kapitoly. Trnava, Pedagogická fakulta, Trnavská univerzita. Trnava. 2018. 96 s. ISBN 97880-568-0166-6

Bocáková M.: Obecná zoologie pro učitele. Vyd. UP v Olomouci, 2009, 77s . ISBN 978 -80-244-2275-6

Csanády, A.: Výkladový a obrazový slovník z morfológie živočíchov. Prešovská univerzita. Prešov 2021, 136 s. ISBN 978-80-5552533-4,
Dostupné z: http://www.pulib.sk/web/kniznica/elpub/dokument/Csanady4 Malina R.: Všeobecná zoológia. FPV, BB, 2004. 95 s.
Majzlan, O. Glváč, M.: Zoológia, 2002, 275 s. ISBN 80-968535-4-6. / iba obecná časť/ Mock, A.: Úvod do porovnávacej morfológie živočíchov. Vysokoškolský učebný text.
Univerzita Pavla Jozefa Šafárika v Košiciach. Košice. 2019, 149s. ISBN 978-80-8152-826-2,
Dostupné z: https://unibook.upjs.sk/sk/prirodovedecka-fakulta/1278-uvod-do-porovnavacej-morfologie-zivocichov Roček, Z. (1998). Obecná morfologie živočichů. Univerzita Karlova. Praha. 1998,
Dostupné z: http://rocek.gli.cas.cz/Courses/courses.html
Trnka, A.: Chordáty. Zoológia a ekológia. Trnavská univerzita. Trnava. 2008. 223 s. ISBN 9788080822446.
Trnka, A.: Všeobecná zoológia. II. Organológia. Trnava. 2017, 84 s. ISBN 978-80-568-0071-3
Trnka, A.: Zoológia chordátov. Vybrané kapitoly. Trnava, Pedagogická fakulta, Trnavská univerzita. Trnava. 2018. 96 s. ISBN 97880-568-0166-6

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Alexander Csanády, PhD., guarantor, lecturer, examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ KZEKO	**Title of Course:** Introduction to Ecology and Environmental Science
Type, scope and method of educational activities: Compulsory course **Form of Study:** lecture, exams **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Study method:** combined **Student workload:** 60 hours Direct education: 20 hours Self-study: 30 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 2nd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Ongoing evaluation. Course assessment: During the semester, the student elaborates, presents at the seminar and submits the seminar work. Unjustified absence from direct teaching (seminar) is assessed as failure to complete the course successfully. Final assessment: The evaluation of the student's learning outcomes within the course of study will be done by the final examination, in writing. Success Criteria (Percentage of Objectives) are for classification grades as follows: a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%	
Aims and Objectives: Learning outcomes: **Acquired knowledge:** **Student:** - acquire basic theoretical knowledge about ecology and environmental studies, - can analyze and recognize processes in ecosystems, - can point out the occurrence of some environmental problems **Acquired skills:** **Student:** - can present basic knowledge about the subject of ecology research, the terminology of the field, the basics of theoretical and applied ecology, - can generalize basic ecological phenomena regardless of the systematic affiliation of organisms when studying their mutual relations with the biotic and abiotic environment, - can describe how these relationships affect the distribution of species and their abundance. Students have knowledge about niche ecology and its role in the formation of communities. They know how to describe the basic mechanisms determining processes in ecosystems, - can define and interpret basic environmental terms and terminology,	

- can present the historical development of environmentalism and environmental law,
- can divide, classify, describe the advantages and disadvantages of renewable and non-renewable natural resources,
- can describe the effects and impacts of individual spheres of economic activity on the environment (transport, energy, urbanization...)

Acquired competences:

Student:

- can apply acquired knowledge and skills,
- can synthesize acquired knowledge and apply it in a global view of the spatial structure of animal distribution,
- knows the basic premises of the assessment of environmental impacts based on EIA standards,
- establish the principles of environmental care,
- can navigate basic international conventions on the protection of individual components of the environment,
- can present the acquired knowledge at the level required by the final test.

Syllabus/Indicative Content:

1. What is ecology? The diversity of life. Global patterns of biodiversity and productivity. Climate and life on Earth.
2. Abiotic environment. Introduction to biotic interactions and population models. Population demography and life history patterns.
3. Interspecies competition. Predation, herbivory, parasitism and other interactions. Similarities and differences in ecological interactions.
4. Ecological communities. Ecosystems: energy flow and nutrient cycles.
5. Structure and composition of ecological communities. Species richness, abundance and diversity.
6. Definition of basic terms (Environmentalism, Environmentalism, etc.) Steps of the process of ascertaining the Environmental situation. Historical foundations of environmentalism and environmental law.
7. Global warming. Non-traditional (alternative) causes of global warming presented recently. Soil degradation (definition of soil, main functions of soil, methods of reducing the soil fund, negative aspects of intensive use of agricultural land, the most common sources of soil pollution and options for reducing pollution).
8. Natural resources: Classification of natural resources. Solar energy and Biomass, Geothermal energy, Water energy, Wind energy and Solar energy (method of use, advantages, disadvantages), Fossil energy raw materials (use, advantages, disadvantages, lifetime of reserves with current consumption). The impact of transport on transport (road, rail, water transport, the negatives that accompany transport, the possibilities of reducing emissions from transport).
9. Water resources and protection in Slovakia, the area of the world with the greatest shortage, or with the largest water reserves (international organizations protecting water and water resources, water scarcity and human health). Energy and energy in the Slovak Republic (production and consumption of energy).
10. Urbanization (definition, current state and expected development in the world, in the EU and in the Slovak Republic, negatives that accompany urbanization). Waste (definitions, classification of waste by departments, states, natural and human waste, waste by place of origin). International conventions on the protection of individual components of the ŽP.

Suggested readings:

COTGREAVE, P., FORSETH, I: Introductory ecology. Wiley & Sons. 2002
TOWNSEND, R.C., BEGON, M., HARPER, L.J.: Základy ekologie. 1. české vyd., Univerzita

Palackého Olomouc: Blackwell Publishing, 2010.
ELIÁŠ, P.: Ekológia. 3 vyd. Slovenská poľnohospodárska univerzita v Nitre: Vydavateľstvo SPU Nitra, 2007.
STORCH D., MIHULKA S.: Úvod do současné ekologie. Portál, Praha 2000
CUNNINGHAM, W. P. ET AL. (1998). Environmental encyclopedia. Gale Research. ISBN 0-8103-9314-X.
KLINDA, J. (2013). Historické základy environmentalizmu a environmentálneho práva. Environmagazín. 2013.
RADVÁNI, P. (2001). Environmentalistika (Vysokoškolské učebné texty pre dištančné štúdium krajinnej ekológie), Banská Štiavnica, 2001, 43 s.
TEREK, J. a VOSTÁL, Z. (2003). Základy ekológie a environmentalistiky. PU FHPV v Prešove, 2003, 210 s.

Language of Instruction: Slovak language

Other course information: -

Grading history

Celkový počet hodnotených študentov:

A	B	C	D	E	FX

Lecturer/Instructor:

RNDr. Radoslav Smoľák, PhD., seminars, examining teacher
Associate prof. Mgr. Martin Hromada, PhD., lecturer, seminars, examining teacher

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KFYZRAB	**Title of Course: Plant physiology**
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, laboratory exams **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Study method:** combined **Student workload: 60 hours** Direct education: 20 hours Self-study: 30 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 2nd semester	
Degree/Level: 1st degree 1 (Bachelor)	
Prerequisities: General botany	
Grading Policy (Assessment/Evaluation): Ongoing evaluation. During the semester, it will be mandatory to writting excercises for 10 points; to obtain an A rating it is necessary to obtain at least 90%, to obtain an B rating at least 80%, to obtain a C rating at least 70%, to obtain a D rating at least 60 points and to obtain an E rating at least 50%.	
Aims and Objectives: After completing the course, the student will be able to explain the principle of basic metabolic processes of the plant organism, will understand the technical terms and use them fluently and correctly in the discussion. Student will be able to prepare basic experiments to demonstrate the physiological processes of plants. **Acquired knowledge:** **Student:** **Acquired skills:** **Student:** - can independently discuss the given issue, - can interpret the acquired knowledge in his own words, - can apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context, - can think critically, formulate own conclusions and defend them. **Acquired competences:** **Student:** - can apply acquired knowledge and skills, - can solve professional tasks.	
Syllabus/Indicative Content: 1. Introduction to plant physiology (historical overview, important researchers, connection of plant physiology with other scientific disciplines, basic rules and duties in the laboratory). 2. Plant development (plant growth, individual growth stages) 3. Mineral nutrition (soil as a source of basic nutrients, micro and macro elements) 4. Photosynthesis - light phase (photosytemes and pigments)	

5. Photosynthesis - dark phase (plants C3, C4 and CAM)
6. Respiration - plant respiration (mitochondria, glycolysis, oxidative decarboxylation, krebs cycle, respiratory chain)
7. Chemosynthesis and heterotrophy
8. Hormonal regulation of plant metabolism (Auxins, gyberelins, cytokines
9. Plant movements (tropisms and nastie)
10. Biological rhythms of plants - dormancy, germination, flowering, aging
11. Plant defense - secondary metabolites
12. Physiology of plant production
13. Ways of perception of exogenous stimuli by plants

Suggested readings:

Masarovičová, E. – Repčák, M. a kol. 2002. Fyziológia rastlín. UK v Bratislave
Taiz L.- Zeiger E. 2010. Plant Physiology. Sinauer Associates Maryland
Schopfer, M.1995. Plant Physiology. Springer. ISBN 978-3-642-081-96-5
Repčák, M. Návody na cvičenia z fyziológie rastlín. UPJŠ - Košice

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Daniela Gruľová, PhD., guarantor, lecturer, examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ANCHEM	**Title of Course:** Inorganic chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 120 hours **Direct education:** 20 hours **Self-study:** 80 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 4	
Semester: 2.	
Degree/Level: 1.	
Prerequisities: General chemistry	
Grading Policy (Assessment/Evaluation): *Success criteria (percentage):* *a) A - 100.00 - 90.00%* *b) B - 89.99 - 80.00%* *c) C - 79.99 - 70.00%* *d) D - 69.99 - 60.00%* *e) E - 59.99 - 50.00%* *f) FX - 49.99 and less%.* Met**hod of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: Acquired knowledge: Student: - acquires knowledge of the chemical systematics of the elements of the periodic table; - will master chemical nomenclature in inorganic chemistry; - acquires knowledge about the occurrence, preparation, production, physical and chemical properties of selected chemical elements; - get acquainted with the most important inorganic compounds, their preparation/production, structure, properties and reactivity; - can list chemical elements and their compounds according to their rational division into groups of the periodic system of elements. Acquired skills: Student: - can describe the equations of chemical reactions and perform chemical calculations; - will be able to choose suitable methods for inorganic syntheses; - can design multi-step reactions for the synthesis of inorganic compounds. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - able to express himself professionally;	

- work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:
Hydrogen and halogens. Chalcogens. Elements of the 15th group. Elements of the 13th group. Elements of the 14th group. Rare gases. Alkaline metals and elements of the 2nd group. A subgroup of scandium, titanium and vanadium. Chromium and manganese subgroup. Iron Triad. Platinum metals. Subgroup of copper and zinc. Chemistry of lanthanides and actinoids.

Suggested readings:
1. Gažo J. a kol.: Všeobecná a anorganická chémia, Alfa, Bratislava 1981.
2. Ondrejovič, G.: Anorganická chémia. Bratislava : ALFA, 1993.
3. Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 3. vyd. Bratislava : Univerzita Komenského, 2006.
4. Šima, J. a i.: Anorganická chémia. 1. vyd. Bratislava: Vyd. STU, 2013.
5. Housecroft, C. E., Sharpe, A. G.: Anorganická chemie. 1. vyd. Praha: VŠChT, 2014.

Language of Instruction: Slovak

Other course information:

Grading history: -

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - lectures
RNDr. Romana Smolková, PhD. - lectures

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ANCHEMCV	**Title of Course:** Exercise in inorganic chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** Laboratory exercises **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 2.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - acquires basic knowledge about the preparation of inorganic substances; - will be able to use the nomenclature of inorganic chemical substances; - will be able to use calculations for planning the synthesis of inorganic chemical substances. Acquired skills: Student: - acquire skills in the field of preparative inorganic chemistry; - acquires skills in verifying the purity of inorganic substances; - will be able to choose suitable methods for inorganic syntheses; - can design multi-step reactions for the synthesis of inorganic compounds. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.;	

- acquires professional competences within his field.

Syllabus/Indicative Content:
Work safety, laboratory aids, calculations during syntheses. Preparation and properties of elements. Preparation and properties of oxides. Preparation and properties of hydroxides. Preparation and properties of acids. Preparation of simple salts and hydrogen salts. Preparation of crystal hydrates and double salts. Heterogeneous reactions: preparation of thio compounds and compounds in an unstable oxidation state. Reactions in aqueous and non-aqueous environments: preparation of complexes.

Suggested readings:
1. Laboratórne cvičenia z chémie pre nechemické odbory/ Smolková R., Mariychuk R. - Prešov: Prešovská univerzita v Prešove, 2022. - 157 s. - ISBN 978-80-555-3028-4.
2. Fajnor, V., Luptáková, V. a Tatiersky, J.: Cvičenia z anorganickej chémie pre biológov. 3. vyd. Bratislava : Univerzita Komenského, 2006.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
Doc. Ruslan Mariychuk, CSc. - laboratory exercises
RNDr. Romana Smolková, PhD. - laboratory exercises

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KELEKT	**Title of Course:** General Physics - Electricity
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exercise **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 2.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): During the semester, the student solves a set of examples. During the semester, he presents the knowledge acquired at the lectures. Student evaluation takes place on the basis of solving a set of homework assignments, active participation in seminars and lectures, and feedback letters during the semester. During the exam period, he passes a knowledge test and an oral exam. The final evaluation is given by the sum of points. Percentage distribution of the resulting assessment: - solving a set of examples during the semester - 30% - feedback sheet during the semester - 10% - active participation in seminars and lectures - 10% - knowledge test and oral exam during the exam period - 50% Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: **Acquired knowledge:** A graduate of this subject can: - Master basic knowledge of general physics (area of electrical phenomenae). - Define and interpret in their own words basic concepts from the field of general physics, laws and phenomena between them. - Describe and classify electrostatic fields.	

- To generalize the acquired knowledge from electricity to a real existing, mutually dependent system of the electromagnetic field.
- Apply knowledge from general physics (electricity) when solving examples and in connection with experimental disciplines.
- Apply knowledge from the subject when making preparations for lessons during pedagogical practice.

Acquired skills:

A graduate of this subject can:
- Apply the regularities of these phenomena and their connections in solving physical problems
- Apply the laws of these phenomena and their connections in other physics courses and in laboratory exercises

Acquired competences:

A graduate of this subject can:
- determine the type of task and propose a solution procedure
- solve natural science problems using the acquired knowledge
- to connect knowledge from different areas of natural sciences.

Syllabus/Indicative Content:

Electrostatic field in vacuum. Coulomb's law. Electrostatic phenomena in dielectrics. Application of electrostatics in practice. Steady electric current. Ohm's law. Electric current in metal conductors. Electrical conductivity of solids. Electrolytic current conduction. Electric current in vacuum and in gases. Semiconductors.

Suggested readings:

1. Halliday, D. - R. Resnick - J. Walker, 2000. Fyzika. Vysokoškolská učebnice fyziky. Praha: Nakladatelství PROMETHEUS. ISBN 978-80-7367-314-7.
2. Tirpák, A. 1999. Elektromagnetizmus. Bratislava: Polygrafia SAV. ISBN 978-80-7367-314-7.
3. Čičmanec, P. a kol. 1980. Všeobecná fyzika 2. Elektrina a magnetizmus. Praha: SNTL. Bratislava: ALFA. ISBN 63-560-80.
4. Feynman, R. P. a kol. 2007. Feynmanove prednášky III. Vydavateľstvo: Nakladatelství Fragment, 2007. ISBN 80-720-042-12
5. Krempaský, J. 1988. Fyzika. Bratislava: ALFA.
6. Hajko, V., Szabó, D. J. 1983. Základy fyziky. Bratislava: VEDA. ISBN 63-144-83.
7. Hajko, V., a kol.1983. Fyzika v príkladoch. Bratislava: ALFA. ISBN 63-144-83.
8. Birčák, J., Benca, V., Šterbáková, K.1996. Elektrina a magnetizmus v príkladoch a otázkach. Prešov: PdF UPJŠ. ISBN 80-7097-348-x.
9. Birčák, J., Benca, V., Šterbáková, K. 2003. Elektrina a magnetizmus v príkladoch a otázkach. Prešov FHPV PU. ISBN 80-8068-225-9.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: RNDr. Jozef Kmec, PhD.
Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KZPRA1	**Title of Course:** Basic physical laboratory exercise 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** laboratory exercise **Number of contact hours:** 0/2 **per week:** 0/2 **per level/semester:** 0/26 **Student workload:** 90 hours **Direct education:** 20 hours **Self-study (exercise preparation):** 20 hours **Protocols preparation:** 40 hours **Protocols defence preparation:** 10 hours **Study method:** combined	
Number of credits: 3	
Semester: 2.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Evaluation during the semester • Theoretical preparation before the experiment (20%) Oral examination consists of two parts: • Evaluation of the elaborated protocols (50%) • Demonstration of the theoretical knowledge and practical competence (30%) Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: A graduate of this subject can: - Master the basic principles of measurement and the theoretical basis of physical phenomena that make up the content of the subject - Master the basic methods of processing measured values Acquired skills: A graduate of this subject can: - Control selected measuring devices and measuring equipment with an emphasis on safety - Be able to draw wiring diagrams and based on them to build a measuring assembly or connect the circuit	

Acquired competences:
A graduate of this subject can:
- Connect theoretical knowledge with practical and apply the acquired theoretical knowledge in the implementation of experiments
- Carry out a physical experiment independently and record the measured values

Syllabus/Indicative Content:

At the beginning of the semester, students are familiarized with the organization of the subject teaching and the principles of work safety in the laboratory, and then perform laboratory exercises from the list according to the schedule that is determined in the introduction.

List of measurements:
1. Determination of the latent heat of melting (using of uLAB measurement system)
2. Measurement of airborne sound velocity by resonance method. Young module measurement.
3. Measurement of surface tension.
4. Viscosity measurement.
5. Measurement of gravitational acceleration by reverse pendulum.
6. Determination of cylinder volume.
7. Determination of the specific heat capacity using of calorimeter.
8. Determining the density of liquids.
9. Measurement of the coefficient of thermal expansion of the air.
10. Determination of Boltzmann Constant.

Suggested readings:

1. Iľkovič, S.: Praktikum z fyziky I, II. FHPV PU Prešov 2008, ISBN 978-80-8068-721-2
2. Iľkovič, S., 2022. Merací systém uLAB, Prešovská univerzita v Prešov vo Vydavateľstve Prešovskej univerzity Prešov, ISBN 978-80-555-2965-3

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMOLFY	**Title of Course:** General Physics – Mollecular physics
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Student workload:** 30 hours **Direct education:** 10 hours **Self-study:** 20 hours **Study method:** combined	
Number of credits: 1	
Semester: 2.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: Acquired knowledge: - correctly understand the basic concepts and methods of molecular physics and thermodynamics - apply basic methods of describing statistical files - use the basics of vector calculus and mathematical analysis (at a level appropriate for the 1st semester) when solving physics problems Acquired skills: - apply the laws of physical phenomena and their connections when solving examples - to understand the intersubject relationships of these phenomena and their links to other technical disciplines - apply knowledge from general physics when solving examples and during laboratory work in practical disciplines - apply knowledge from general physics 1 when creating preparations for lessons during pedagogical practice Acquired competences: - Competences related to learning outcomes;	

- Professional-subject competences – physics teacher as a guarantor of conveying scientific foundations through the application of modern progressive methods;
- Organizational and management competences – a teacher able to plan his activities;
- Diagnostic and intervention competences – a teacher able to diagnose the problem of his students;
- Competences of reflection of one's own activity – a teacher capable of reflecting, evaluating and modifying one's own educational activities;

Syllabus/Indicative Content:

- Molecular physics, basics of the kinetic theory of gases - Basic ideal gas laws, concept of temperature and gas thermometer. Equation of state of an ideal gas. Maxwell's distribution of velocities of molecules of an ideal gas. Boltzmann's law. Equipartition theorem. Frequency of collisions between molecules and mean free path of molecules. Brownian motion.
- Basics of thermodynamics - First and second thermodynamic theorems - Carnot cycle, thermodynamic equilibrium, reversible and irreversible processes. Heat capacity and specific heat
- Molecular phenomena in liquids. Surface tension and phenomena at the interface of three states.
- Changes of state - Critical point and critical parameters. Liquefaction of gases. Phase transitions.
- Transfer phenomena - heat conduction, thermal conductivity of gases, internal friction and diffusion of gases. Real gases and their equations of state.

Suggested readings:

1. HLAVIČKA, A.: Fyzika pre pedagogické fakulty 1.Praha 1978
2. HAJKO, V. SZABÓ,J.,D. : Základy fyziky. Veda, Bratislava 1980
3. KVASNICA, J. a kol. : Mechanika. Academia, Praha 1988
4. VEIS, Š. a kol. : Všeobecná fyzika 1. Alfa 1978

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Mária Csatáryová, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KANAT	**Title of Course: Human Anatomy**
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exams **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 40 hours Guided work: 20 hours	
Number of credits: 3	
Semester: 3rd semester	
Degree/Level: 1st degree 1 (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Exam. Active participation in lectures and seminars is mandatory for successful completion of the course. A student may have a maximum of 2 absences during the semester, excused on the basis of a medical certificate. The student will make up the absences, the form of compensation will be determined by the lecturer. In case of more absences or unexcused absences, the student will not be awarded credits. There will be oral or written examinations in classes during the semester. The final evaluation of the course will result in an oral examination (the instructor is required to notify students in advance of a change in the form of examination). Assessment criteria: A: 100.00 - 90.00 %, B: 89.99 - 80.00 %, C: 79.99 - 70.00 %, D: 69.99 - 60.00 %, E: 59.99 - 50.00 %. FX: 49,99 % and below.	
Aims and Objectives: **Knowledge gained:** The student: - The student can define and interpret the basic concepts of human anatomy in his/her own words; - knows the anatomical names of organs and their parts in Slovak and Latin language; - understands the principles of human body structure, knows the shape, structure, position and interrelation of its parts; - is able to discuss the anatomical composition of the human body; - is able to classify body parts and organs in such detail that the knowledge acquired provides a basis for understanding human physiological and pathological processes. **Skills Acquired:** The student: - Can solve problems and select procedures in an active manner; - can justify research steps and interpret the results; - can acquire new information in the field of human anatomy in an active way. **Acquired competences:** The student: - Organizational competencies; can organize a classroom team; - can express requests; praise and criticism;	

- can work as a team; can compromise;
- can foster good social relations in the classroom, in the team;
- has developed competences for further self-education in the field of human anatomy;
- can use the acquired theoretical knowledge with its subsequent synthesis and application in other professional subjects.

Syllabus/Indicative Content:

Basic anatomical concepts. Skeletal system. Muscle system.
The respiratory system. Digestive system. Vascular system. Anatomy of the heart, blood vessels. Lymph system. The spleen, lymph vessels. Urinary system.
Genitals - male and female.
Sensory organs - positionally organ of hearing, sight organ, olfactory and gustatory organ.
Nervous system. Central nervous system.
Peripheral nervous system - head and spinal nerves and vegetative nerves.
Endocrine system.

Suggested readings:

BOŠÁK, V., 2019: Biológia človeka pre nelekárske študijné programy. Trnava: Typi Universitatis Tyrnaviensis, 1. vydanie. ISBN 978-80-568-0363-9.
MELLOVÁ, Y. a kol. 2010.Anatómia človeka pre nelekárske študijné programy. 183s. Osveta v Martine. ISBN 978-80-8063-335-6
POSPÍŠIL, M.F. 2002. Biológia človeka 1. Univerzita Komenského, ISBN: 80-223-1542-7.
PARKER, S. 2008. Ľudské telo.256 s. Ikar a.s. Bratislava. ISBN 978-80-551-1731-7
SINĚĽNIKOV, R.D. 1970. Atlas anatómie člověka. Avicenum, Praha.

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. MVDr. Soňa Mačeková, PhD., guarantor, lecturer, examiner
Mgr. Andrea Babejová, PhD., examiner
PaedDr. Silvia Duranková, PhD., examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KFGEO	**Title of Course: Physial geography and geoecology**
Type, scope and method of educational activities: Compulsory course **Form of Study:** lecture, exams **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Study method:** combined **Student workload: 60 hours** Direct education: 20 hours Self-study: 30 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 3th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Ongoing evaluation. Unexcused non-participation of more than 30% in direct teaching is assessed as failure to meet the conditions for successful completion of the course. The evaluation of the student's study results within the study subject will take place: a) continuous control of study results during the teaching part of the semester (seminar paper), b) written exam. The success criteria (percentage expression of the results in the evaluation of the subject) are for classification levels as follows: a) A - 100.00 – 90.00% b) B - 89.99 – 80.00% c) C - 79.99 – 70.00% d) D - 69.99 – 60.00% e) E - 59.99 – 50.00% f) FX - 49.99% and less	
Aims and Objectives: **Acquired knowledge:** By completing the subject, the student demonstrates the ability to: - name and characterize individual physical-geographical spheres of the Earth, - describe the origin of the Earth and the history of its development - describe the composition of the lithosphere, hydrosphere, atmosphere and the processes that take place in them, - name and characterize geological eras, describe and determine geological zones on the territory of Slovakia, - interpret the regularities of the distribution of soils on Earth and characterize the pedological conditions of Slovakia, - describe the horizontal and vertical division of the biosphere. **Acquired skills:** - can interpret the acquired knowledge in his own words,	

- is able to apply acquired knowledge in the implementation of practical tasks in an interdisciplinary context,
- can think critically, formulate own conclusions and defend them.

Acquired competences:

- able to acquire acquired knowledge and skills,
- can solve professional tasks,
- knows how to coordinate partial activities and work collectively,
- has the ability to further his education after completing the subject
- they can acquire and interpret new information in the field of physical geography.

Syllabus/Indicative Content:

1. Origin of the Earth, history of the Earth, physical-geographic spheres of the Earth, movements of the Earth.
2. Lithosphere - composition, planetary division of the lithosphere, tectonic disturbances, volcanism, formation of rocks, division of rocks and their use
3. Lithosphere – georelief, processes and forms of georelief, geological processes and their consequences.
4. Geological eras, geological zones on the territory of Slovakia.
5. Pedosphere – characteristics, physical and chemical properties of soils, soil composition, soil-forming factors, soil-forming process.
6. Pedosphere – soil classification system, laws of distribution of soils on Earth, principle of soil zonality, soils of Slovakia.
7. Biosphere – characteristics, function and position of the organization in the country, horizontal division of the biosphere, vertical division of the biosphere. The emergence of the biosphere as the interaction of individual spheres of the Earth.
8. Biosphere – phytogeographical and zoogeographical division of Slovakia.
9. Hydrosphere – watery lands, the creation and development of the river network, measurable characteristics of water flows, types of river outflow regime, creation and distribution of lakes.
10. Hydrosphere - world ocean, physical and chemical properties of sea water, movements of sea water, tidal phenomena.
11. Hydrosphere – hydrological conditions of Slovakia.
12. Atmosphere - composition, vertical division, climatic factors, atmospheric processes, flow of excitement, pressure formations.
13. Atmosphere - main climatic zones of the Earth, meteorological elements, weather, weather forecast, synoptic map, climatic characteristics of Slovakia.

Suggested readings:

TRIZNA, M.: 2004. Klimageografia a hydrogeografia. Bratislava: Geografika,
PLESNÍK, P.: 2004.Všeobecná biogeografia, Bratislava: PF UK,
NETOPIL R. a kol.: , 1989. Fyzická geografie I Praha: SPN
HORNÍK S.a kol.: 1989. Fyzická geografie II. Praha: SPN,
LAUKO, V. : 2003. Fyzická geografia Slovenska. Bratislava: MAPA Slovakia,
OBOŇA J., DEMKOVÁ L. 2021. Základy ekológie krajiny. 1. vyd. - Prešov : Vydavateľstvo Prešovskej univerzity. 129 s.

Language of Instruction: Slovak language

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:

Doc. RNDr. Lenka Demková, PhD. – lecturer, examiner, seminar leader Doc. Ing. Jozef Oboňa, PhD. – lecturer, examiner, seminar leader
Last update: 30 September 2024
Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ORGCHEM	**Title of Course:** Organic chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 120 hours **Direct education:** 20 hours **Self-study:** 80 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 4	
Semester: 3.	
Degree/Level: 1.	
Prerequisites: *General chemistry*	
Grading Policy (Assessment/Evaluation): *Success criteria (percentage):* *a) A - 100.00 - 90.00%* *b) B - 89.99 - 80.00%* *c) C - 79.99 - 70.00%* *d) D - 69.99 - 60.00%* *e) E - 59.99 - 50.00%* *f) FX - 49.99 and less%.* **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: After completing the course, the student: - acquires knowledge about the properties and reactivity of basic types of organic compounds; - control the mechanisms of basic organic reactions; - be able to design simple transformations and interconversion of functional groups. Acquired skills: Student: - will be able to design multi-step syntheses of organic compounds. - can perform basic laboratory operations with organic substances and solvents. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content: Nomenclature and types of organic compounds. Bonds in organic molecules. Electron effects, acid-base properties of organic compounds. Alkanes and cycloalkanes, substitution radical reactions. Alkenes and alkynes, electrophilic addition reactions.	

Dienes, electrophilic addition reactions, cycloaddition reactions. Aromatic hydrocarbons, electrophilic substitutions, reactions in side chains of alkylarenes. Halogen derivatives, nucleophilic substitutions, eliminations, organometallic compounds. Isomerism of organic compounds. Alcohols, ethers, phenols, thiols, sulfides. Organic compounds containing nitrogen, amines, nitro compounds, diazonium salts. Carbonyl compounds, nucleophilic additions, oxidations, reductions, reactions at alpha-carbon. Carbohydrates. Carboxylic acids, structure, acid-base properties. Functional derivatives of carboxylic acids, nucleophilic acyl substitutions, condensation reactions. Substitution derivatives of carboxylic acids. 5- and 6-membered heterocyclic compounds.

Suggested readings:

1. P. Hrnčiar: Organická chémia, UK Bratislava, 1997.
2. W.H. Brown: Organic Chemistry, Saunders College Publishing, New York, 1995.
3. P. Hrnčiar a kol. Organická chémia v príkladoch, UK Bratislava, 1998.
4. J. McMurry: Organická chemie, MU Brno, 2007.
5. P. Elečko a kol.: Laboratórne cvičenie z organickej chémie, UK Bratislava, 1998
6. M. Slivka, Y. Farinuk, R. Mariychuk, Organic chemistry. Organic chemistry for students of ecological specialities. Presov. 2021.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures
RNDr. Romana Smolková, PhD. – seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ORGCHEMCV	**Title of Course:** Exercise in organic chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** Laboratory exercises **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 3.	
Degree/Level: 1.	
Prerequisites:	
Grading Policy (Assessment/Evaluation): *Success criteria (percentage):* *a) A - 100.00 - 90.00%* *b) B - 89.99 - 80.00%* *c) C - 79.99 - 70.00%* *d) D - 69.99 - 60.00%* *e) E - 59.99 - 50.00%* *f) FX - 49.99 and less%.* **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - acquires basic knowledge about the preparation of organic substances; - will be able to use the nomenclature of organic chemical substances; - will be able to use calculations for planning the synthesis of organic chemical substances. Acquired skills: Student: - master the basic operations used in organic chemistry (distillation, extraction, crystallization, thin-layer chromatography); - will learn to prove the basic functional groups of organic substances with simple chemical tests; - can design several step reactions of the synthesis of organic compounds. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.;	

- acquires professional competences within his field.

Syllabus/Indicative Content:
Work safety in an organic laboratory, basic types of glass and devices. Distillation and refractive index. Crystallization, melting point. Thin layer chromatography. Extraction. Characterization and identification of organic compounds by simple chemical tests.

Suggested readings:
1. Laboratórne cvičenia z chémie pre nechemické odbory/ Smolková R., Mariychuk R. - Prešov: Prešovská univerzita v Prešove, 2022. - 157 s. - ISBN 978-80-555-3028-4.
2. P. Hrnčiar a kol. Organická chémia v príkladoch, UK Bratislava, 1998.
3. M. Slivka, Y. Farinuk, R. Mariychuk, Organic chemistry. Organic chemistry for students of ecological specialities. Presov. 2021.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - laboratory exercises
RNDr. Romana Smolková, PhD. - laboratory exercises

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMAGN	**Title of Course:** General Physics - Magnetism
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, laboratory exercise **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 3.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): During the semester, the student solves a set of examples. During the semester, he presents the knowledge acquired at the lectures. Student evaluation takes place on the basis of solving a set of homework assignments, active participation in seminars and lectures, and feedback letters during the semester. During the exam period, he passes a knowledge test and an oral exam. The final evaluation is given by the sum of points. Percentage distribution of the resulting assessment: - solving a set of examples during the semester - 30% - feedback sheet during the semester - 10% - active participation in seminars and lectures - 10% - knowledge test and oral exam during the exam period - 50% Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: **Acquired knowledge:** A graduate of this subject can: - Master basic knowledge of general physics (field of magnetic phenomena). - Define and interpret in their own words basic concepts from the field of general physics, laws and phenomena between them. - Describe and classify magnetic fields. - To generalize the acquired knowledge from magnetism to a realistically existing, mutually dependent electromagnetic field system.	

- Apply knowledge from general physics (magnetic phenomena) when solving examples and in connection with experimental disciplines.
- Apply knowledge from the subject when preparing for lessons during pedagogical practice.

Acquired skills:

A graduate of this subject can:
- Apply the regularities of these phenomena and their connections in solving physical problems
- Apply the laws of these phenomena and their connections in other physics courses and in laboratory exercises

Acquired competences:

A graduate of this subject can:
- determine the type of task and propose a solution procedure
- solve natural science problems using the acquired knowledge
- to connect knowledge from different areas of natural sciences.

Syllabus/Indicative Content:

Magnetic field in vacuum. Basic magnetic phenomena. Magnetic induction vector. Biot-Savart-Laplace law. Ampere and Lorentz force. Interaction of magnetic field and current. Magnetic phenomena in magnetics. Electromagnetic induction. Alternating currents. Electromagnetic oscillations and waves.

Suggested readings:

1. Halliday, D. - R. Resnick - J. Walker, 2000. Fyzika. Vysokoškolská učebnice fyziky. Praha: Nakladatelství PROMETHEUS. ISBN 978-80-7367-314-7.
2. Tirpák, A. 1999. Elektromagnetizmus. Bratislava: Polygrafia SAV. ISBN 978-80-7367-314-7.
3. Čičmanec, P. a kol. 1980. Všeobecná fyzika 2. Elektrina a magnetizmus. Praha: SNTL. Bratislava: ALFA. ISBN 63-560-80.
4. Feynman, R. P. a kol. 2007. Feynmanove prednášky III. Vydavateľstvo: Nakladatelství Fragment, 2007. ISBN 80-720-042-12
5. Krempaský, J. 1988. Fyzika. Bratislava: ALFA.
6. Hajko, V., Szabó, D. J. 1983. Základy fyziky. Bratislava: VEDA. ISBN 63-144-83.
7. Hajko, V., a kol.1983. Fyzika v príkladoch. Bratislava: ALFA. ISBN 63-144-83.
8. Birčák, J., Benca, V., Šterbáková, K.1996. Elektrina a magnetizmus v príkladoch a otázkach. Prešov: PdF UPJŠ. ISBN 80-7097-348-x.
9. Birčák, J., Benca, V., Šterbáková, K. 2003. Elektrina a magnetizmus v príkladoch a otázkach. Prešov FHPV PU. ISBN 80-8068-225-9.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: RNDr. Jozef Kmec, PhD.
Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KOPTIK	**Title of Course:** General Physics - Optics
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, laboratory exercise **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Student workload:** 120 hours **Direct education:** 30 hours **Self-study:** 60 hours **Guided work:** 30 hours **Study method:** combined	
Number of credits: 4	
Semester: 3.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): During the semester, the student solves a set of examples. During the semester, he presents the knowledge acquired at the lectures. Student evaluation takes place on the basis of solving a set of homework assignments, active participation in seminars and lectures, and feedback letters during the semester. During the exam period, he passes a knowledge test and an oral exam. The final evaluation is given by the sum of points. Percentage distribution of the resulting assessment: - solving a set of examples during the semester - 30% - feedback sheet during the semester - 10% - active participation in seminars and lectures - 10% - knowledge test and oral exam during the exam period - 50% Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: **Acquired knowledge:** A graduate of this subject can: - Master the basic knowledge of general physics from the theory of oscillations, waves and optics. - Define and interpret in their own words basic concepts from the field of general physics, laws and phenomena between them. - Define basic concepts from the optical field of electromagnetic waves. **Acquired skills:**	

A graduate of this subject can:
- Apply the regularities of these phenomena and their connections when solving physical problems
- Apply the laws of these phenomena and their connections in other physics courses and in laboratory exercises
- Apply knowledge from the subject when preparing for lessons during pedagogical practice.

Acquired competences:

A graduate of this subject can:
- determine the type of task and propose a solution procedure
- solve natural science problems using the acquired knowledge
- to connect knowledge from different areas of natural sciences
- apply links to technical and technological disciplines and technical systems (or devices, machines and tools) used in society.

Syllabus/Indicative Content:

Oscillations. Linear harmonic oscillator. Composition of oscillations. Waves, types of waves. Optical frequency/wavelength domain, wave equation in cartesian, cylindrical and spherical coordinate system, coherence, polarization. Concept of photon, corpuscular-wave dualism. Propagation, reflection, refraction and dispersion of light. Interaction of optical radiation with matter. Einstein's coefficients, inverse population, optical and non-optical pumping. Laser, resonator, mode. Blackbody radiation. Radiation noise, Poisson distribution. Fourier transform. Geometric optics. Imaging equation. Wave optics. Interference and bending (Fresnel and Frauhoffer). Two-beam and many-beam interference. Optical lattice. Holography. Dispersion prism. Fundamentals of spectroscopy. Detection of optical radiation. Radiometry and photometry. Optical fibres.

Suggested readings:

1. Štrba, A.: Všeobecná fyzika 3. Optika, Alfa, Bratislava 1980
2. Krempaský, J.: Fyzika. Alfa, Bratislava 1988
3. Birčák, J. a V. Benca a M. Salák, 2002: Kmity, vlny, optika v príkladoch a otázkach, PU v Prešove, Prešov 2002
4. Štrba, A. a V. Mesároš, a D. Senderáková, 2012: Svetlo. Enigma Publishing, Bratislava, 2012http://www.lightandmatter.com/lm/
5. Halliday, D.-Resnick, R.-Walker, J.: Fundamentals ofPhysics, 8th Edition. Hardcover august 2008. Universityof Pittsburgh. ISBN: 978-0-470-04472-8
6. Crowell, B.: Electricity and magnetism. 2005.
7. HyperPhysics - http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
8. http://www.freebookcentre.net/Physics/Optics-Books-Download.html
9. http://www.lightandmatter.com/html_books/4em/ch06/ch06.html

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Mária Csatáryová, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KGENE	**Title of Course: General genetics**
Type, scope and method of educational activities: Compulsory course **Form of Study:** lecture, exams **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 40 hours Guided work: 20 hours	
Number of credits: 3	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Exam. Completion of the course is assessed by a final examination. During the semester, the student will take written examinations in genetic terminology and genetic examples, which account for 30% of the grade. The final written (oral) examination accounts for 70% of the final grade. A grade of A: 100 – 90 % of the marks, B: 89 – 80 % marks, C: 79 – 70 % marks, D: 69 – 60 % marks, E: 59 – 50 % marks. A student scoring less than 50% will be graded FX. The final grade will be calculated as the average of the grades on the term paper, the written test on genetic terminology, the examples, and the final exam. Attendance at lectures and seminars (direct instruction) is compulsory. A student may have a maximum of 2 absences excused on the basis of a medical certificate. For absences, the student will be given make-up assignments or undergo counselling. In case of unexcused absences or a greater number of absences, no credits will be awarded to the student.	
Aims and Objectives: **Knowledge gained:** The student will be able to: - Define and explain in own words concepts from genetic terminology; - describe the structure and types of DNA and RNA; - characterize and explain DNA replication, transcription, translation, properties of the genetic code and solve given problems; - describe the cell cycle, explain the different phases of the cell cycle and regulatory mechanisms; - describe amitosis, mitosis, meiosis, apoptosis and necrosis; - define and explain in their own words the concept of chromosome, the number and structure of chromosomes, the differences between prokaryotic and eukaryotic chromosomes; - characterise and explain modes of inheritance - monogenic, multifactorial, polygenic, extra-nuclear inheritance; - define the terms mutation and mutagen, correctly classify mutations, give examples of mutations; - identify the possible consequences of the mutation (positive, negative, neutral);	

- explain mutagenesis, characterize the symptomatology of selected mutations and assess the difference between numerical and structural chromosomal aberrations;
- describe Mendel's rules of inheritance - laws, give examples, solve given problems;
- define Morgan's rules - gene linkage, forms, phases, examples, solve given problems;
- explain the genetic basis of biochemical diseases, hereditary enzyme deficiencies in humans and animals;
- clarify the meaning of population genetics, classify the genetic structure of a population and describe the law of genetic equilibrium in their own words in the context of autogamous and panmictic population models;
- describe the Hardy-Weinberg law of genetic equilibrium (give formulas for calculating allele and genotype frequencies, solve given problems);
- characterize the investigative methods used in genetics - hybridological, genealogical, gemelilogical, cytogenetic, molecular-genetic; be able to construct a pedigree.

Skills acquired:

The student will be able to:
- observe and record the shape of chromosomes during cell division;
- observe the differences of chromosomes between sexes;
- search and process information about the influence of different types of mutagens on the occurrence of mutations and their effect on organisms;
- solve examples focused on the genetic code, Mendel and Morgan rules of inheritance
- justify the results;
- draw a genealogical scheme of a selected family, where a certain trait, disease is observed.
- present the results of genetic analyses (calculations) and diagrams in class and discuss the issue;
- independently prepare a term paper on a selected topic in the field of genetics;
- prepare a PowerPoint presentation;
- present the seminar paper in class and discuss the topic.

Competences acquired:

The student will be able to:
- use and apply the acquired knowledge in the context of the content of other subjects;
- understand interrelationships and contexts;
- hierarchically organize the acquired knowledge and facts in genetics;
- look for causal relationships in acquired knowledge and processes, thus developing logical thinking;
- recognize clinical manifestations, causes of genetic pathologies, consequences of pathologies for human life and health;
- to search for information in the field of genetics in professional literature and information media, to work with relevant information;
- develop reading literacy in the study of professional texts in the field of genetics;
- creatively solve given tasks, point out the causes of problems and propose solutions;
- use the acquired knowledge, skills and abilities in further studies and apply them in practice.

Syllabus/Indicative Content:

Introduction to genetics. Basics of genetic terminology.
Molecular basis of genetic information - structure and types of DNA and RNA.
Replication, transcription, translation of DNA, genetic code (examples, solving of tasks).
Laws of cell division - cell cycle, cell cycle regulation, cell differentiation. Programmed cell death - apoptosis, unprogrammed cell death - necrosis, cell aging.
Laws of reproduction, types of reproduction - asexual, sexual reproduction. Gametogenesis, spermatogenesis, apomixis, in vitro fertilization.

Chromosomal basis of inheritance - structure and number of chromosomes, prokaryotic and eukaryotic chromosomes.
Heredity of organisms - monogenic inheritance, multifactorial inheritance, polygenic inheritance, extra-nuclear inheritance.
Mendelian rules of inheritance - laws, examples, solving problems. Morgan's rules - gene linkage, forms, phases, examples, solving problems.
Mutations - classification of mutations (spontaneous, induced, mitochondrial, somatic, genetic), mutagens, mutations and environment.
Chromosomal aberrations - numerical, structural, causes of chromosomal aberrations.
Genetics of biochemical processes - biochemical diseases and their nature, hereditary enzyme deficiencies in humans and animals, disorders of carbohydrate, protein, lipid, haemoglobin metabolism.
Gene regulation of ontogenesis - regulation during zygote budding, cell differentiation and embryonic induction, sex ontogeny in mammals, humans, etc.
Morphological developmental defects - natural, pharmaceutical, industrial, agricultural, metabolic teratogens. Drugs. Mutants with malformation and lethal effect.
Genetically determined pathologies - numerical aberrations of autosomes, gonosomes, structural aberrations of chromosomes.
Population genetics - genetic structure of population, model of autogamous and panmictic population, Hardy-Weinberg law of genetic equilibrium (examples, solving of given problems), gene pool of population, migration, adaptive value and genetic load of population.
Investigative methods used in genetics - hybridological, genealogical, gemelilogical, cytogenetic, molecular-genetic and others.
Prenatal diagnostics - invasive and non-invasive methods of prenatal diagnostics, FDD-MB method.

Suggested readings:

PORÁČOVÁ, J., VAŠKOVÁ, J., NAGY, M. a kol. 2015. Všeobecná genetika. Prešov: FHPV PU. 397 s. ISBN 978-80-555-1523-6.

SNUSTAD, D. P., SIMMONS, M. J. 2009. Genetika. Brno: Masaryková univerzita. 894 s. ISBN 978-80-210-8613-5.

PORÁČOVÁ, J., ŠUTIAKOVÁ, I., PETRÁŠOVÁ, D., a kol. 2006. Základy genetiky pre študentov vysokých škôl prírodovedného zamerania. Prešov: FHPV PU v Prešove. 267 s. ISBN 80-8068-455-3.

ROSYPAL, S. 2006. Úvod do molekulární biologie. Díl první. Brno: Tiskárna Těchov, Blansko. 289 s. ISBN 80-902562-5-2.

SRŠEŇ, Š., SRŠŇOVÁ, K. 2005. Základy klinickej genetiky a jej molekulárna podstata. 4. prepracované a rozšírené vydanie. Martin: Osveta. 445 s. ISBN 80-8063-185-9.

KOČÁREK, E. 2008. Genetika. Mníšek pod Brdy: Scientia. 212 s. ISBN 9788086960364.

NUSSBAUM, R. L., MCINNES, R. R., WILLARD, H. F. 2004. Klinická genetika. Praha: Triton. 426 s. ISBN 88-7254-475-6.

OTOVÁ, B., MIHALOVÁ, R. 2013. Základy biológie a genetiky človeka. Praha: Karolinum, 228 s. ISBN 978-80-2462-109-8.

ČELLÁROVÁ, E. a kol. 2001. Príklady zo všeobecnej genetiky. Košice: PF UPJŠ. 126 s. ISBN 80-7097-460-5.

PRITCHARD, D. J. 2021. Základy lékařské genetiky. 2. vyd. Praha: Galén. 242 s. ISBN 978-80-7262-449-2.

TANERI, B. et al. 2020. Human Genetics and Genomics. Germany: Wiley – VCH Verlag GmbH & Co. 163 p. ISBN 978-3-527-68263-8.

Language of Instruction: Slovak language

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. RNDr. Marta Mydlárová Blaščáková, PhD. – lecturer, examiner, seminar leader
prof. MVDr. Janka Poráčová, PhD., MBA – lecturer, examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KBIOCH	**Title Course: Biochemistry**
Type, scope, and method educational activities: Compulsory subject **Form of Study:** lecture, laboratory exams **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 40 hours Guided work: 20 hours	
Number credits: 3	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: Organic chemistry	
Grading Policy (Assessment/Evaluation): Exam. Active participation in lectures and seminars, preparation of a term paper in the form of Preparation of a term paper, preparation of a PowerPoint with subsequent presentation. Successful completion of the intermediate test with a minimum pass mark of 60%. Successful completion of the interim assessment is a prerequisite for the final assessment. The successful completion of the intermediate assessment is a prerequisite for the final assessment. (b) Final assessment: Successful completion of a written test - a test of the material covered; the knowledge acquired the knowledge gained from the seminars and self-study. Success criteria: A: 100.00 - 90.00 %; B: 89.99 - 80.00 %; C: 79.99 - 70.00 %; D: 69.99 - 60.00 %; E: 59.99 - 50.00 %; FX: 49.99 % and below.	
Aims and Objectives: Knowledge gained: Graduate: - demonstrate general knowledge of biochemistry; - interpret basic biochemical concepts; describe chemical terminology; - characterize the structure of important substances in animal and human organisms; - assess and describe factors influencing the rate of biochemical reactions; structure and function of biocatalysts of metabolic processes. Skills Acquired: - investigate factors that impair cell structure or function; - investigate biochemical processes occurring in living organisms and biochemical laws of metabolism; - explain the metabolic transformations of individual substances in an organism; the interconversion of biologically important substances in an organism; - describe the regulatory mechanisms of metabolic transformations in living systems;	

- investigate the composition of food (sugars, fats, proteins, vitamins, minerals, water) and the properties, composition and structure of sugars, fats and proteins;
- discuss and highlight the latest knowledge and importance of the subject;
- assess the consequences of malfunctioning of cells and regulatory mechanisms, enzymes, hormones.

Competencies acquired:
Student:
- has basic ideas about scientific procedures and applies them in his/her their own process of cognition;
- can solve professional tasks;
- apply the acquired knowledge to pedagogical practice also in the framework of inter-subject relations.

Syllabus/Indicative Content:
Metabolic functions of the cell. Chemical reactions - characteristics, rate, Michaelis - Menten equation. Enzymes - general characteristics, nomenclature, distribution, structure and function of enzymes, regulation of enzyme activity. Carbohydrate metabolism. Citrate (Krebs) cycle - metabolic and energetic role, reactions and enzymes of the cycle, energy balance. Respiratory chain, oxidative phosphorylation, cellular respiration. Lipid metabolism - fatty acid synthesis, triacylglycerol biosynthesis, beta-oxidation of fatty acids, cholesterol conversion. Protein and amino acid metabolism. Conversion of the carbon skeleton of amino acids. Formation of urea - ornithine - citrulline cycle. Metabolism of nucleic acids - biosynthesis and degradation. Vitamins - structure, biosynthesis, biochemical significance. Hormones - structure, biosynthesis, biochemical significance. Regulatory mechanisms of biochemical processes.

Suggested readings:
PORÁČOVÁ, J. a kol. 2015. Základné biochemické procesy organizmov.
DOBROTA, D. A KOL. 2012. Lekárska biochémia. Martin: Osveta. 723 s. ISBN 978-80-8063- 293-9.
MURRAY, R.K., BENDER, D.A., BOTHAM, K.M., KENNELLY, P.J. A KOL. 2013. Harperova ilustrovaná biochemie. 5. čes. vyd. Praha: Galén, 730 s. ISBN 978-807-2629-077.
KOOLMAN, J. A K.H. RÖHM 2012. Barevný atlas biochemie. 1. české vyd. Praha: Grada, 2012, 498 s. ISBN 978-802-4729-770.
MATOUŠ, B. A KOL. 2010. Základy lékařské chemie a biochemie. Praha: Galén. 540s.ISBN 978-80-7262-702-8.
TURECKÝ, L. 2008. Lekárska biochémia II. Bratislava: Asklepios. 200s. ISBN 978-80-7167-123-7.
LÍŠKA, B. A BRECHTLOVÁ, M. 2008. Vybrané kapitoly z funkčnej biochémie. Bratislava: Asklepios. 83 s.
CAMPBELL, M. K. A S.O. FARRELL 2008. Biochemistry, Thomson Brooks/Cole, Belmont. 751 s.
KOLEKTÍV 2006. Lekárska biochémia I. Bratislava: Univerzita Komenského. 242 s. ISBN 80-223-1091-3.
FERENČÍK, M., ŠKÁRKA, B., NOVÁK, M. A TURECKÝ, L. 2000. Biochémia. Bratislava: Slovak Academic Press s.r.o. 924 s.

Language Instruction: Slovak language

Other course information:

Grading history
Total number assessed students:

A	B	C	D	E	FX

Lecturer/Instructor: prof. MVDr. Janka Poráčová, PhD., MBA, lecturer, examiner RNDr. Mária Konečná, PhD., examiner, seminar leader					
Last update: 30 September 2024					
Approved by: doc. Ruslan Maryichuk, CSc., guarantor					

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ANCHEM	**Title of Course:** Analytical chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 120 hours **Direct education:** 20 hours **Self-study:** 80 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 4	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - acquires knowledge about methods of studying the structure and properties of substances; - becomes familiar with different types of physical-chemical analyzes and limitations of analytical methods; - will be able to choose an appropriate analytical method depending on the amount and properties of the analyzed sample and the assigned task; Acquired skills: Student: - can perform advanced calculations in chemical analysis; - can propose an optimal method for analyzing the structure or properties of substances; - can evaluate the results of analytical measurements; - can work with computer software designed to solve individual tasks in analytical chemistry; Acquired competences: Student: - the student will be able to use professional terminology from analytical chemistry, which he will use not only to increase everyday communicative competences, but will	

also be able to communicate professionally with the commercial sector - laboratories, production or processing chemical, biological and biochemical plants, etc.;
- can evaluate the results of experiments and analyses, formulate conclusions and discuss them;
- can express himself professionally and use different types of chemical computer software;
- can work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:
Analytical chemistry - general terminology, analytical reactions, preparation of solutions. Qualitative chemical analysis – common, selective and specific reagents for cations and anions. Quantitative chemical analysis – volumetric and gravimetric analysis. Volumetric titrations. Classification of titration methods. Acid-base titrations. Precipitation titrations. Complexometric titrations. Redox titrations. Electroanalytical methods - potentiometry, electrogravimetry, and coulometry. Optical methods in analytical chemistry. Spectral methods – FTIR, UV-VIS, NMR, AAS. Non-spectral optical methods – refractometry, polarimetry, RTG diffraction analysis. Purification and separation techniques – chromatography.

Suggested readings:
1. J. Garaj a kol.: Analytická chémia, SNTL/ALFA, Bratislava 1987
2. Majer L. a kol. Analytická chémia, 1989
3. Gondova T. a kol. Analytická chémia, Košice, 1998
4. A. Skoog, F.J. West, F.J.Holler: Analytical Chemistry. An Introduction, Saunders College, 6th ed., Philadelphia, 1994.
5. R.Keller (Ed.): Analytical chemistry, Wiley-VCH, Weinheim 1998.
6. Dean's Analytical Chemistry Handbook. Pradyot Patnaik, McGraw-Hill Education - Europe, 2004, 1280 p.
7. Handbook of Green Analytical Chemistry, Eds: Miguel de la Guardia Salvador Garrigues, 2012, ISBN: 9780470972014, John Wiley a Sons, Ltd, 566 p.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - lectures
RNDr. Romana Smolková, PhD. - lectures

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ANCHEMCV	**Title of Course:** Analytical chemistry exercise
Type, scope and method of educational activities: Compulsory subject **Form of Study:** Laboratory exercises **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - knows how to navigate chemical analysis methods; - can perform calculations in chemical analysis. Acquired skills: Student: - acquires practical experimental knowledge from the basics of classical and instrumental analytical techniques; - acquires skills in forging procedures and methodologies aimed at determining selected analytes in various samples; - can evaluate the results of analytical measurements. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - able to express himself professionally; - work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content:	

Analytical chemistry – basic concepts, analytical reactions, preparation of solutions. Qualitative chemical analysis - group, selective and specific reactions of cations and anions. Quantitative chemical analysis: volumetric analysis and gravimetry. Optical methods: UV-Vis and infrared spectroscopy. Non-spectroscopic optical methods. Refractometry, polarimetry, X-ray diffractometry. Purification and separation methods - chromatography: gas and liquid.

Suggested readings:

1. R. Halko, K. Chovancová, S. Procházková: Laboratórne cvičenia z optických metód chemickej analýzy, STU v Bratislave, 2021.
2. Handbook of Green Analytical Chemistry, Eds: Miguel de la Guardia Salvador Garrigues, 2012, ISBN: 9780470972014, John Wiley a Sons, Ltd, 566 p.
3. Laboratórne cvičenia z chémie pre nechemické odbory/ Smolková R., Mariychuk R. - Prešov: Prešovská univerzita v Prešove, 2022. - 157 s. - ISBN 978-80-555-3028-4.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

Doc. Ruslan Mariychuk, CSc. - laboratory exercises
RNDr. Romana Smolková, PhD. – laboratory exercises
RNDr. Adriana Eliašová, PhD. – laboratory exercises
RNDr. Daniela Gruľová, PhD. – laboratory exercises

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KTFYZ1	**Title of Course:** Theoretical Physics 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exercise **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Student workload:** 120 hours **Direct education:** 30 hours **Self-study:** 90 hours **Study method:** combined	
Number of credits: 4	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation/Exam.	
Aims and Objectives: **Acquired knowledge:** - The graduate of the course will master the basics of the analytical theory of theoretical mechanics. **Acquired skills:** - Can independently solve basic tasks of theoretical mechanics. - He will master the use of the lectured principles for solving tasks. - Will master the basics of deformation theory. - He will understand the issue of the continuum. - Become familiar with the basic models of liquids and gases. **Acquired competences:** - Based on the acquired knowledge, he will master the basics of quantum and statistical physics.	
Syllabus/Indicative Content: 1. Introduction, basic mathematics 2. Basic of particle kinematics – velocity, acceleration, areal velocity, areal acceleration, angular velocity angular acceleration 3. Curved coordinate systems, kinematics of relative motion 4. Basic terminology of dynamics of particles system - Newton´s laws of motion 5. Law of momentum conservation of free particle, law of angular momentum conservation of free particle	

6. Kinetic energy of particle and power of force. Work of force
7. Conservative force field
8. Potential energy of particle
9. Law of mechanical energy conservation of the free particle
10. Conservative force as gradient of potential energy
11. Potential of conservative force field
12. Motion equations of free particles system
13. First equation of motion and law of momentum conservation of particles system
14. Second equation of motion and law of momentum conservation of particles system
15. Kinetic energy of free particles system
16. Potential energy of free particles system
17. Dynamics of relative motion
18. Galilei transformations
19. Constraints and their classification. Configuration space
20. Principle of virtual works. Balance conditions
21. D`Alembert's and Lagrange principle
22. Lagrange equations of the first kind
23. Generalized coordinates, generalized forces, potential generalized forces
24. Deduction of Lagrange equations of the second kind
25. Legendre transformation
26. Hamilton's equations, Hamilton function properties
27. Basic of variation calculation. Hamilton principle
28. Evidence of Hamilton principle and D`Alambert's principle equivalence
29. Deduction of Hamilton equations from Hamilton principle.
30. Time-space symmetries and laws of conservation.
31. Integral principles - energy integral, momentum integral, angular momentum integral
32. Introduction to rigid body dynamics
33. Euler kinematics equations.
34. Tensor of inertia and kinetic energy of solid body.
35. Euler dynamic equations
36. Gyroscopes
37. Subject matter and methods of continuum mechanics study
38. Volume force, arial force, vector a tensor of tension
39. Continuum balance conditions
40. Continuity equation and continuum motion equations
41. Fluid mechanics.

Suggested readings:

1. Tóth, Ľ., Tóthová, M.: Teoretická mechanika I., II., Učebné texty, Košice 1985
2. Obetková, V., Mamrillová, A., Košinárová, A.: Teoretická mechanika, Alfa, Bratislava 1990
3. Havránek, A.: Klasická mechanika I. (Učební texty Univerzity Karlovy v Praze – Nakladatelství Karolinum 2002).
4. Havránek, A.: Klasická mechanika II. (Učební texty Univerzity Karlovy v Praze – Nakladatelství Karolinum 2003).
5. Dreizler, Reiner M., Lüdde, Cora S.: Theoretical Mechanics, Springer 2010, ISBN 978-3-642-11137-2

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Prof. RNDr. Marián Reiffers, DrSc.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KDIDF1	**Title of Course: Didactics of physics 1**
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Student workload:** 60 hours **Direct education:** 10 hours **Self-study:** 50 hours **Study method:** combined	
Number of credits: 2	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Percentage distribution of the resulting assessment: - Final assessment 50% - Feedback letters 10% - Elaboration and ongoing defense of the 1st part of the coursework 10% - Active participation in lectures 10% - Recalculation of physical tasks 6th and 7th year. primary school 10% - Progressive teaching methods - report + presentation 10% Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: **Acquired knowledge:** - explain the development of opinions on the role of physics didactics in physics education; - describe and explain basic pedagogical documents related to the implementation of the educational process; - describe and explain the causes of current problems in teaching physics; - characterize concepts of physical education, describe individual models of physical education; Professional knowledge: - define and interpret in their own words basic concepts from the field of physics didactics and the relationships between them; - describe the activity procedure and principles of planning the curriculum of a lesson with physical content;	

- characterize basic trends and areas of modernization of physics teaching;
- describe and explain the essence and meaning of applying interdisciplinary relations;
- explain the essence of physical laws, classify individual groups;
- describe and classify the methods of pedagogical research applied within the didactics of physics.

Acquired skills:

Cognitive skills:
- can propose solutions to methodological, professional and practical problems;
- can apply and modify professional and didactic knowledge from the field of science education when innovating the teacher's pedagogical activities;
- plan and formulate measurable educational goals at the cognitive, affective and conative levels and justify the need to formulate measurable educational goals;
- distinguish individual groups of physical concepts, describe the stages of creation of physical concepts, relationships between physical quantities, physical laws;
- perform a didactic analysis of the curriculum, critically assess and evaluate the curriculum, propose solutions for methodological procedures for conveying the curriculum to students.

Practical skills:
- develop examples of the application of innovative methods in teaching physics;
- implement the application of the principles of curriculum planning for a lesson with physics content in the preparation of a physics lesson;
- implement solutions to methodological, professional and practical problems;
- creatively use methods in the introduction of physical laws, their practical implementation in accordance with the stages of the introduction of physical laws;

Acquired competences:

The individual is characterized by:
- independence in solving problems;
- creative and flexible thinking;
- the ability to professionally present the results of one's own studies during the implementation of seminar works;
- apply modern innovative and activation methods with innovative and creative thinking;
- responsibility for the preparation of the learning activity of the group of pupils and its results.

Syllabus/Indicative Content:

1. Didactics of physics as a science.
2. Research methods in physics didactics,
3. Cognitive, affective and conative goals and their taxonomy.
4. Current problems of teaching physics.
5. Modernization of the didactic system of physics.
6. Physical elements in teaching physics at l. primary school.
7. Content of physics at the 2nd st. ZŠ. State and school educational program.
8. Motivation and activation of students' cognitive activity.
9. Cognitive interest in teaching physics.
10. Physical concepts, classification and method of their formation.
11. Relationships between physical quantities.
12. Physical laws, principles.
13. Interdisciplinary relations and coordination of curriculum with other subjects.

Suggested readings:

1. Kašpar, E. 1978. Didaktika fyziky. SPN Praha.
2. Fuka, J. 1986. Didaktika fyziky. Skriptum, UP Olomouc.

3. Janovič, J. 1998. Vybrané kapitoly z didaktiky fyziky. Skriptum, UK Bratislava.
4. Janovič, J. 1990. Didaktika fyziky. Skriptum. UK Bratislava.
5. Turek, I. 2009.Didaktika. Ekonómia. Bratislava: Prvé vydanie ISBN 978-80-8078-198-9
6. Turek, I. 1998 Zvyšovanie efektívnosti vyučovania. 2.doplnené vydanie. Bratislava. Metodické centrum, 1998. ISBN 80-88796-89-X
7. Magazines, i.e. Matematika, fyzika a informatika, Fyzikálne obzory
8. Internetové zdroje

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Dr. h. c. doc. PaedDr. Vladimír Šebeň, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KIKTPR	**Title of Course: Information and communication technology (ICT) in natural sciences education**
Type, scope and method of educational activities: Compulsory course **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester:** 0/13 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Attendance is mandatory for all seminars for successful completion of the course. Requirement for passing the course is to create and present own project with ICT topic. Students are allowed a maximum of 2 excused absences providing all relevant information and supporting documentation. If a student misses any of the sessions with an approved excused absence, the student will be required to complete an equitable assignment or consultations as determined by the course coordinator/instructor. In case of exceeding number of unexcused absences, the student will be ineligible to sit for the continues and final assessment. Written tests will be used for evaluating the learning outcomes Evaluation criteria: A: 100.00% - 90.00%, B: 89.99% - 80.00%, C:79.99% - 70.00%, D: 69.99% - 60.00%, E: 59.99% - 50.00%, FX: 49.99% or less.	
Aims and Objectives: **Learning outcomes:** To improve the level of the student's information and communication literacy. **Acquired knowledge:** Student: - has knowledge that enables effective use of individual ICTs - can characterize pedagogical, technical and organizational aspects of the use of ICT in education, - knows the principles of design of e-learning materials, - develops of attitudes and values leading to responsible and safe using of ICT **Acquired skills:** The student has: - can effectively use MS Office tools (MS Word for creating and editing text, managing the principles of working with the MS Excel spreadsheet, using MS PowerPoint presentation software tools),	

- can search for reliable information and reliable sources, use fact-checking platforms,
- can use ICT to collect, analyse, critically evaluate and use information,
- it is possible to use ICT in different contexts and for different purposes based on the understanding of terms, concepts, systems and processes,
- could accept new stimuli in the field of ICT and critically assess them, understand the rapid development of technologies, their importance for personal development and their impact on society
- can work with an interactive whiteboard
- can via suitable software system design e-Learning material for natural science education

Acquired competences:

Student:
- has developed competencies for further self-education in the field of information and communication technologies,
- can use theoretical knowledge and practical skills in problems solving in the field of information and communication technologies.
- can take responsibility for the team results.
- can implement and synthesize acquired knowledge in practice.

Syllabus/Indicative Content:

Course content:

Use of ICT in education (fundamentals of educational technologies, technologies and tools). The computer as a teaching tool. Microsoft Office. Website Browsing and Communications. Spreadsheet calculator. Using databases. Interactive whiteboard. Software for creating electronic educational materials. Creation of interactive learning materials and principles of their correct creation. Individual work on a project in the field of science education. Presentation of project results.

Suggested readings:

Practical guide to the Microsoft Office 2010 office suite. Available on the Internet: https://www.unipo.sk/public/media/15344/Microsoft-Office-2010.pdf

STOFFOVÁ, V.: Computer, universal teaching tool. FPV UKF Nitra 2004. ISBN 80-8050-765-1

Modern didactic technique in the teacher's work. Košice: UIPŠ in collaboration with elfa, p. r. o., 2010. ISBN 978-80-8086-135-3.

PRIBILOVÁ, K.: Information literacy. Trnava: Trnava University in Trnava - Faculty of Education, 2013. ISBN 978-80-8082-682-6

PŠENÁKOVÁ, I.: Creation of interactive applications. 1st ed. Trnava: Typi Universitatis Tyrnaviensis, joint workplace of the University of Trnava in Trnava and VEDY, publishing house of the Slovak Academy of Sciences, 2019. 72 p. ISBN 978-80-568-0380-6

Language of Instruction: Slovak language

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:

RNDr. Daniela Hegedűš Grejtáková, PhD. – examiner, seminar leader

Assoc. Prof. MVDr. Soňa Mačeková, PhD. – lecturer, examiner, seminar leader

Assoc. Prof. Eva Petrejčíková, PhD. – lecturer, examiner, seminar leader

Assoc. Prof.. Dana Dojčáková, PhD. – lecturer, examiner, seminar leader Assoc. Prof. Lenka Demková, PhD.– lecturer, examiner, seminar leader
Last update: 30 September 2024
Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KFYZZC	**Title of Course: Physiology of animals and human**
Type, scope and method of educational activities: Compulsory course **Form of Study:** lecture, laboratory exams **Number of contact hours:** 2/1 **per week:** 2/1 **per level/semester:** 26/13 **Study method:** combined **Student workload: 90 hours** Direct education: 30 hours Self-study: 30 hours Guided work: 30 hours	
Number of credits: 3	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: General zoology	
Grading Policy (Assessment/Evaluation): Exam Active participation in lectures and laboratory exercises. Successful completion of the oral examination, i.e. from the lecture material, knowledge gained in the exercises and self-study. Assessment criteria: A: 100.00 - 90.00 %, B: 89.99 - 80.00 %, C: 79.99 - 70.00 %, D: 69.99 - 60.00 %, E: 59.99 - 50.00 %. FX: 49,99 % and below.	
Aims and Objectives: **Knowledge gained:** Graduate: - Demonstrate general knowledge of animal and human physiology and gain a comprehensive picture of the functioning and activity of individual systems in the body; - interpret the knowledge acquired about the individual components in terms of their functions and significance; - explain and describe the principle of functioning of the individual systems; - investigate the functional interconnection of individual systems and physiological processes in terms of their integration and the regulation of behaviour in animal organisms. **Skills Acquired:** - Design a method of data acquisition, identify patterns, relational/causal relationships, explain the relationship between a model and a real phenomenon/object; - Demonstrate by posing and defending arguments the difference between physiological functions of animals and humans as well as pathological functions of animals and humans; - assess the consequences of malfunctioning of cellular and regulatory mechanisms; - laboratory exercises will enable the graduate to acquire knowledge in analyzing the results of hematological examination, identifying selected substances present in the blood, to determine the influence of various factors on changes in heart rate and respiratory rate, to investigate various ways of excretion of unnecessary and harmful substances by organisms, to simulate mechanisms of hormonal and nervous regulation and to observe the irritability of sensory organs. **Competencies acquired:** - to implement the application of acquired knowledge in pedagogical practice;	

- to developed skills and abilities to continuously educate and train others in pedagogical practice;
- to concretise methodological recommendations and their application in practice.

Syllabus/Indicative Content:

An introduction to the subject of physiology. Molecules, energy and biosynthesis. Physiology of the digestive system. Physiology of the respiratory system. Physiology of the cardiovascular system. Physiology of the excretory system. Physiology of the nervous system. Physiology of the sensory organs. Physiology of the endocrine system. Physiology of the muscular system. Physiology of the skin. Physiology of reproduction.

Suggested readings:

PORÁČOVÁ, J. a kol. 2014. Fyziológia živočíchov a človeka. FHPV PU v Prešove. 591s. ISBN 978-80-555-1150-4.

PORÁČOVÁ, J. a kol. 2014. Vybrané cvičenia z fyziológie živočíchov a človeka. FHPV PU v Prešove. 241s. ISBN 9788055511030.

GREŠOVÁ a kol.: Praktické cvičenia z fyziológie I. 2015; I. Bračoková: Praktické cvičenia z fyziológie. Časť 2. 2002.

GUYTON AND HALL.Textbook of Medical Physiology 13th Edition, (12th, 11th)

ČALKOVSKÁ, A., 2010. Fyziológia človeka pre nelekárske študijné odbory. Martin: Osveta, 220 s. ISBN 9788080633448.

KOVÁČIK, J.et al. 2012.Fyziológia živočíchov. Nitra: SPU. 178 s.

WARD, J., LINDEN, R., 2010. Základy fyziológie. Praha: Galen. 164 s.

JAVORKA, K., 2006. Lekárska fyziológia. Osveta: Martin. 678 s. ISBN 8080632316.

PAULOV, Š., 1980. Fyziológia živočíchov a človeka. SNP, 648 s.

DRÁBEKOVÁ, J. a kol., 2003. Praktické cvičenie z fyziológie živočíchov a človeka. Nitra, 96 s. ISBN 80-8050-646-9.

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of students assessed:

A	B	C	D	E	FX

Lecturer/Instructor:

Prof. MVDr. Janka Poráčová, PhD., MBA, - lecturer, examiner
RNDr. Mária Konečná, PhD., - examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Maryichuk, CSc.,guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KSEMBP1	**Title of Course: Bachelor thesis seminar 1**
Type, scope and method of educational activities: Compulsory course **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester:** 0/13 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 5th semester	
Degree/Level: 1. degree (Bachelor)	
Prerequisities:-	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Conditions for the award of credit: attendance and activity at seminars - submission of all assignments that will be given to the student during the semester; elaboration of a seminar paper that the student will prepare in accordance with the requirements of the PU Guidelines. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively. undergoes consultations. In case of unjustified non-participation or a large number of absences, the student will not be granted credits. Students will write a seminar paper on the assigned topic: a) the seminar work is handed over by the students to the teacher in printed form within the set deadline. b) if the student does not submit his / her work within 7 days of the set deadline, he / she will not be granted credits. c) the scope of work is determined by the teacher, the work will be in A4 format, line spacing 1.5, font Times New Roman, size 12. d) it is necessary to follow the technique and ethics of citation in the work. Use Harvard system when quoting - Name and date. • The seminar paper must have the following structure: 1. Front part: a) cover (title of the work, name and surname of the author, year) b) title page (title of the thesis, name and surname of the teacher, subject, name and surname of the student, field of study, year) c) content (contains the names of the main parts and subparts of the work with page numbers, as well as a list of appendices and information about their location) d) list of illustrations and list of tables (if there are tables and figures in the work, a complete list of their names is given) e) list of abbreviations and symbols (if there are marks, symbols, abbreviated names in the work, which are not common and immediately understandable to the reader, they must be explained in this section) 2. Core work (main text):	

a) Introduction (Refers to the topic specifically and introduces the reader to the issue. It contains clear information about the problem or project, the reasons for which the author deals with them.)
b) Core (The main part of the text is divided into chapters, subchapters, paragraphs, sub-paragraphs, etc. Each main part starts on a new page. The logical sequence of chapters is important.)
c) Conclusion (The factual conclusions, own contribution or view are summarized by the author in the conclusion of the work. The conclusions provide a brief description of the work with evaluation of results and estimation of significance for theory and practice.
d) List of bibliographic references (sorted alphabetically by name, according to standard STN 690: 2012)
• the following are evaluated in the work:
• analytical-synthetic thought processes of the student,
• expression of one's own opinion supported by theoretical knowledge and one's own,
• determining problems and goals of work, method of processing,
• work structure - logical continuity and balance of individual parts,
• work with literature and information sources (choosing the way to use them)
• compliance with basic standards for formal work, compliance with citation standards
• aesthetic and linguistic side of the work.

Percentage representation of individual tasks in the overall evaluation of the student.
Active work at the seminar 20%
Seminar work 80%.
The student must complete each task at least 50%.

Aims and Objectives:
Knowledge gained:
The student will be able to:
- state and explain the general requirements for the production of the final thesis, describe and characterize the content structure of the final thesis and its individual parts (Introduction, main body of the text, appendices);
- explain the concepts of phenomenon, fact, list and describe the types of investigations of pedagogical phenomena, characterize in more detail the basic methods of data collection in the thesis and the ways of their processing;
- explain the concept of potential, actual text; list the basic requirements for the author of a professional text; characterize and describe the model, features of a professional text and its formal construction;
- define the concept of abstract, list and distinguish the different types of abstracts, describe the structure of an abstract, characterize the features of a good abstract, list the most common mistakes in abstract creation, distinguish an abstract from an annotation, abstract, summary, overview;
- explain the concepts of citation, quotation, citation, paraphrase, compendium, plagiarism, distinguish citation from paraphrase, illustrate the different techniques of citation and referencing (Harvard system - name and date, footnotes) with examples.

Skills acquired:
The student will be able to:
- apply the basic methodology of preparing a bachelor thesis in its theoretical and empirical part;
- apply information from the University of Prešov Directive on the requirements of thesis;
- independently search for literary sources, work with them and cite them correctly according to the currently valid standards;
- independently prepare a final seminar paper on the topic of their bachelor thesis.

- create a text with a logical and precise formulation of ideas based on the acquired knowledge, create a quality abstract, write an introduction, conclusion to an article, to a thesis, respecting the established requirements;
- use the various methods of citation and referencing, record bibliographic references;
work with specialist literature (primary and secondary sources, search for information in book databases);
- create (plan, process) a theoretical and practical seminar paper with all the necessary formalities.

Acquired competences:

The student will be able to:
- be aware of the need and importance of observing the "academic bon ton". (i.e. politeness, courtesy, tact) for his/her student life as well as for his/her future teaching life;
- behave in accordance with the rules of social behaviour;
- observe the ethics of citation;
- express his/her beliefs and opinions directly and honestly;
- be able to recognise that the other party is entitled to his/her own opinion;
- bear the consequences, accept responsibility for one's actions.

Syllabus/Indicative Content:

- About the bachelor thesis and its writing.
- Content and formal aspect of the thesis
- Structure, scope and formal arrangement of the thesis,
- Literary sources - their use in scientific papers, principles of citation, plagiarism and compilation,
- Introduction, abstract, conclusion,
- Thesis reviews, originality check.
- General requirements for the creation of the final thesis. Assignment, structure and time schedule of the final work. Working with literature.
- Theoretical background and basic concepts. Types of research of pedagogical phenomena. Basic methods of data collection in ZP. Methods of quantitative and qualitative processing of ZP results.
- General principles and construction of the text. ZP structure.
- Formal page and editing of the final work.
- Abstract - types and scope of abstracts, practical advice on their creation.
- Citation and list of bibliographic references in ZP. Basic terms - Quote, paraphrase, compilation, plagiarism. Main principles and methods of referencing and quoting. Schemes of bibliographic references.
- Evaluation and defense of the final thesis.
- Fundamentals of academic ethics and etiquette.

Suggested readings:

1. Smernica Prešovskej univerzity o náležitostiach záverečných prác. 2013 [online]. Dostupné na: http://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica-2013.pdf
2. Usmernenie k písaniu a prezentácii záverečných prác Katedry biológie FHPV PU. 2013 [online]. Dostupné na: http://www.unipo.sk/fakulta-humanitnych-prirodnych-vied/katedry/biologia
3. Bernasovská J. a kol. 2020. Základy akademického písania záverečnch prác v biológii. Prešov: Vydavateľstvo Prešovskej university. ISBN: 978-80-555-2616-4.
4. Staroňová K. 2011: Vedecké písanie. Ako písať akademické a vedecké texty. Martin: Osveta. ISBN: 9788080633592

DARÁK, M. a J. FERENCOVÁ, 2001. Metodológia pedagogického výskumu. Terminologické minimum. Prešov: ManaCon. ISBN80-89040-07-1.
DARÁK, M. a N. KRAJČOVÁ, 1995. Empirický výskum v pedagogike. Prešov: ManaCon. ISBN80-85668-22-X.
GONDA, V. 2012. Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition. ISBN 978-80-8078-472-0.
KAHN, N. B., 2001. Jak efektivně studovat a pracovat s informacemi. Praha: Portal. ISBN 80-7178-443-5.
KATUŠČÁK, D., 1998. Ako písať vysokoškolské a kvalifikačné práce. Bratislava. ISBN 80-85697-82-3.
MEŠKO, D., D. KATUŠČÁK, J. FINDRA a kol., 2005. Akademická príručka. Martin: Osveta. ISBN 80-8063-200-6.
JUNGER, J., 2000. Diplomová práca. Interný metodický materiál FHPV PU. Prešov: FHPV.
MEŠKO, D., D. KATUŠČÁK, J. FINDRA a kol., 2005. Akademická príručka. Martin: Osveta. ISBN 80-8063-200-6.
PASTERNÁKOVÁ, L. 2020. Výcovné a vzdělávácí metody ve světě edukace. Týn nad Vltavou: Nová Forma. ISBN 978-80-7612-222-2.
PASTERNÁKOVÁ, L. 2014. Inovácie na FHPV PU v Prešove. In: Univerzita v kontexte zmien. Prešov: Vydavateľstvo Prešovskej univerzity. ISBN 978-80-555-1279-2. s. 569-572.

Language of Instruction: slovak language

Other course information: Compulsory subject, students enroll in the subject only once, from the approbation from which they write the bachelor's thesis.

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. RNDr. Marta Mydlárová Blaščáková, PhD.; seminar leader, gurantor
doc. Ing. Jozef Oboňa, PhD. seminar leader, gurantor

Last update: 4. March 2025

Approved by: doc. Ruslan Maryichuk, CSc.,guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/FYZCHEM	**Title of Course:** Physical chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 2	
Semester: 5.	
Degree/Level: 1.	
Prerequisites: General chemistry	
Grading Policy (Assessment/Evaluation): *Success criteria (percentage):* *a) A - 100.00 - 90.00%* *b) B - 89.99 - 80.00%* *c) C - 79.99 - 70.00%* *d) D - 69.99 - 60.00%* *e) E - 59.99 - 50.00%* *f) FX - 49.99 and less%.* **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - acquires knowledge of the basics of physical chemistry; - will understand the physical principles of chemical events and will be able to interpret them; - will understand the structure and properties of chemical substances, energy and time course of chemical reactions; - the student becomes familiar with various experimental physico-chemical methods. Acquired skills: Student: - can evaluate the results of physical measurements; - can perform basic thermodynamic calculations, calculations of electrochemical potentials and calculations of solution concentrations and their pH; Acquired competences: Student: - acquires professional terminology from the field of physical chemistry, thereby increasing his communicative competence and being able to express himself professionally; - will be able to use the acquired knowledge as a basis for further study or in practice;	

- will be able to work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:
Equation of state of an ideal gas, isothermal, isochoric, isobaric processes. Thermometer. Avogadro's law. Real gases, van der Waals equation, attractive and repulsive forces. System, temperature, heat, work and internal energy. Enthalpy, standard enthalpy, calorimetry, thermochemistry, endothermic and exothermic processes. Heat capacity, internal pressure and Joule-Thomson coefficient. Liquefaction of gases. Entropy, a spontaneous and disordered process. Combination of entropy with enthalpy, Gibbs energy. Chemical potential and extent of reaction. Reaction Gibbs energy, chemical equilibrium and equilibrium constant. Roult's law, two-component system, phase diagram, azeotrope and eutectic. Types of liquids, surface tension and viscosity. Solid substances, their surfaces, adsorption, heterogeneous catalysis and nanotechnology. Photochemistry. Electrolytic dissociation. Electrical conductivity of electrolytes. Electrolysis and Faraday's laws. Molar conductivity of ions. Chemical balance in electrolyte solutions, dilution law, ionic product of water, hydrolysis of salts, buffer solutions. Galvanic cells, electromotive voltage, electrodes and electrode potential, practical applications of galvanic cells. Chemical reaction rate, mass effect law, reaction order. Kinetics and mechanism of chemical reaction, types of chemical reactions.

Suggested readings:
1. P. W. Atkins: Fyzikálna chémia, STU Bratislava 1999.
2. V. Kellö, A. Tkáč: Fyzikálna chémia; Alfa, Bratislava 1969.
3. J. Bareš, Č. Černý, V. Fried, J. Pick: Příklady a úlohy z fyzikální chemie. SNTL/ALFA 1971.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
Doc. Ruslan Mariychuk, CSc. - lectures
RNDr. Romana Smolková, PhD. – seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KSEMBP1	**Title of Course:** Bachelor thesis seminar 1
Type, scope and method of educational activities: Compulsory subject **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester:** 0/13 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 5th semester	
Degree/Level: 1. degree (Bachelor)	
Prerequisities:-	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Conditions for the award of credit: attendance and activity at seminars - submission of all assignments that will be given to the student during the semester; elaboration of a seminar paper that the student will prepare in accordance with the requirements of the PU Guidelines. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively. undergoes consultations. In case of unjustified non-participation or a large number of absences, the student will not be granted credits. Students will write a seminar paper on the assigned topic: a) the seminar work is handed over by the students to the teacher in printed form within the set deadline. b) if the student does not submit his / her work within 7 days of the set deadline, he / she will not be granted credits. c) the scope of work is determined by the teacher, the work will be in A4 format, line spacing 1.5, font Times New Roman, size 12. d) it is necessary to follow the technique and ethics of citation in the work. Use Harvard system when quoting STN ISO 690: 2012 - Name and date. The seminar paper must have the following structure: 1. Front part: a) cover (title of the work, name and surname of the author, year) b) title page (title of the thesis, name and surname of the teacher, subject, name and surname of the student, field of study, year) c) content (contains the names of the main parts and subparts of the work with page numbers, as well as a list of appendices and information about their location) d) list of illustrations and list of tables (if there are tables and figures in the work, a complete list of their names is given) e) list of abbreviations and symbols (if there are marks, symbols, abbreviated names in the work, which are not common and immediately understandable to the reader, they must be explained in this section)	

2. Core work (main text):
a) Introduction (Refers to the topic specifically and introduces the reader to the issue. It contains clear information about the problem or project, the reasons for which the author deals with them.)
b) Core (The main part of the text is divided into chapters, subchapters, paragraphs, sub-paragraphs, etc. Each main part starts on a new page. The logical sequence of chapters is important.)
c) Conclusion (The factual conclusions, own contribution or view are summarized by the author in the conclusion of the work. The conclusions provide a brief description of the work with evaluation of results and estimation of significance for theory and practice.
d) List of bibliographic references (sorted alphabetically by name, according to standard STN 690: 2012)
• the following are evaluated in the work:
• analytical-synthetic thought processes of the student,
• expression of one's own opinion supported by theoretical knowledge and one's own,
• determining problems and goals of work, method of processing,
• work structure - logical continuity and balance of individual parts,
• work with literature and information sources (choosing the way to use them)
• compliance with basic standards for formal work, compliance with citation standards
• aesthetic and linguistic side of the work.

Percentage representation of individual tasks in the overall evaluation of the student.

Active work at the seminar 20%
Seminar work 80%.

The student must complete each task at least 50%.

Aims and Objectives:

Knowledge gained:

The student will be able to:
- state and explain the general requirements for the production of the final thesis, describe and characterize the content structure of the final thesis and its individual parts (Introduction, main body of the text, appendices);
- explain the concepts of phenomenon, fact, list and describe the types of investigations of pedagogical phenomena, characterize in more detail the basic methods of data collection in the thesis and the ways of their processing;
- explain the concept of potential, actual text; list the basic requirements for the author of a professional text; characterize and describe the model, features of a professional text and its formal construction;
- define the concept of abstract, list and distinguish the different types of abstracts, describe the structure of an abstract, characterize the features of a good abstract, list the most common mistakes in abstract creation, distinguish an abstract from an annotation, abstract, summary, overview;
- explain the concepts of citation, quotation, citation, paraphrase, compendium, plagiarism, distinguish citation from paraphrase, illustrate the different techniques of citation and referencing (Harvard system - name and date, footnotes) with examples.

Skills acquired:

The student will be able to:
- apply the basic methodology of preparing a bachelor thesis in its theoretical and empirical part;
- apply information from the University of Prešov Directive on the requirements of thesis;

- independently search for literary sources, work with them and cite them correctly according to the currently valid standards;
- independently prepare a final seminar paper on the topic of their bachelor thesis.
- create a text with a logical and precise formulation of ideas based on the acquired knowledge, create a quality abstract, write an introduction, conclusion to an article, to a thesis, respecting the established requirements;
- use the various methods of citation and referencing, record bibliographic references; work with specialist literature (primary and secondary sources, search for information in book databases);
- create (plan, process) a theoretical and practical seminar paper with all the necessary formalities.

Acquired competences:

The student will be able to:
- be aware of the need and importance of observing the "academic bon ton". (i.e. politeness, courtesy, tact) for his/her student life as well as for his/her future teaching life;
- behave in accordance with the rules of social behaviour;
- observe the ethics of citation;
- express his/her beliefs and opinions directly and honestly;
- be able to recognise that the other party is entitled to his/her own opinion;
- bear the consequences, accept responsibility for one's actions.

Syllabus/Indicative Content:

- About the bachelor thesis and its writing.
- Content and formal aspect of the thesis
- Structure, scope and formal arrangement of the thesis,
- Literary sources - their use in scientific papers, principles of citation, plagiarism and compilation,
- Introduction, abstract, conclusion,
- Thesis reviews, originality check.
- General requirements for the creation of the final thesis. Assignment, structure and time schedule of the final work. Working with literature.
- Theoretical background and basic concepts. Types of research of pedagogical phenomena. Basic methods of data collection in bachelor thesis. Methods of quantitative and qualitative processing of bachelor thesis results.
- General principles and construction of the text. Bachelor thesis structure.
- Formal page and editing of the final work.
- Abstract - types and scope of abstracts, practical advice on their creation.
- Citation and list of bibliographic references in bachelor thesis Basic terms - Quote, paraphrase, compilation, plagiarism. Main principles and methods of referencing and quoting. Schemes of bibliographic references.
- Evaluation and defence of the final thesis.
- Fundamentals of academic ethics and etiquette.

Suggested readings:

1. Smernica PU o náležitostiach záverečných prác, ich bibliografickej registrácii, kontrole originality, uchovávaní a sprístupňovaní. 2019 [online]. Dostupné na: https://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica2019.pdf
2. Staroňová K. 2011: Vedecké písanie. Ako písať akademické a vedecké texty. Martin: Osveta. ISBN: 9788080633592
3. Benčo, J., 2001. Metodológia vedeckého výskumu. Bratislava: Iris. ISBN 80-89018-27-0.

4. Darák, M. a J. Ferencová, 2001. Metodológia pedagogického výskumu. Terminologické minimum. Prešov: ManaCon. ISBN80-89040-07-1.
5. Darák, M. a N. Krajčová, 1995. Empirický výskum v pedagogike. Prešov: ManaCon. ISBN80-85668-22-X.
6. De Vito, J. A., 2001. Základy mezilidské komunikace. Praha: Grada. ISBN 80-7169-988-8.
7. Gonda, V. 2012. Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition. ISBN 978-80-8078-472-0.
8. Katuščák, D., 1998. Ako písať vysokoškolské a kvalifikačné práce. Bratislava. ISBN 80-85697-82-3.
9. Magnello, E. a B. van Loon, 2010. Seznamte se ... Statistika. Praha: Portál. ISBN 978-80-7367-753-4.
10. Ondrejkovič, P., 2005. Úvod do metodológie sociálnych vied. Bratislava: Regent. ISBN 80-88904-35-8.

Language of Instruction: Slovak language

Other course information: Compulsory subject, students enroll in the subject only once, from the approbation from which they write the bachelor's thesis.

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc.
RNDr. Romana Smolková, PhD.

Last update: 16. October 2024

Approved by: doc. Ruslan Maryichuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KTFYZ2	**Title of Course:** Theoretical Physics 2
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, exercise **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 20 hours **Guided work – Moodle tests:** 20 hours **Study method:** combined	
Number of credits: 2	
Semester: 5.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): During the semester student • prepares feedback sheets (25%) • elaborates distance tasks in the Moodle portal (25%) Student at the end of the semester • demonstrate theoretical knowledge in the field of Electromagnetic field theory and also demonstrate analytical skills and knowledge of mathematical apparatus in expressing quantitative relations of quantities (50%) Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation/Exam.	
Aims and Objectives: Knowledge: - Understand the notation symbolism of the quantities in the Theory of the electromagnetic field - Expand knowledge in the field of electromagnetic phenomena by mastering Maxwell's theory of the electromagnetic field - Gain knowledge of differential operators used in the theory of electromagnetic field - Get an idea of the application of some phenomena of the electromagnetic field in practice Skills: - Be able to work with differential operators in solving tasks and in enforcing laws - Be able to derive important formulas using mathematical apparatus Competences:	

- Apply general skills in solving differential equations in solving problems in the Theory of Electromagnetic Field
- Interpret the theoretical results of derived quantitative and qualitative relations
- Correctly interpret the results of solved tasks
- Consider special cases of application of Maxwell's equations in practice.

Syllabus/Indicative Content:

Electrostatics: field of the point charge, the system of point charges and the charged body, multipole series of the potential of the system of the point charges and the charged body, the dipole, Maxwell's equations for the electrostatic field, Poisson and Laplace equation for the potential of the electrostatic field and the methods of their solving, Electric field in the dielectric, Dielectric in the external electric field, Energy of the electrostatic field.

Magnetostatics: Ampere principle, Biot-Savart-Laplace principle, Vector potential of the magnetic field. Ampere's Circuital Law, Maxwell equations for magnetics, Energy of the magnetic field, Faraday's law of induction, Displacement current, The complete system of Maxwell equations, Conservation of energy of the electromagnetic wave. The pressure of the light. Propagation of the electromagnetic wave in the homogeneous dielectric medium. Propagation of the electromagnetic wave in the conducting medium.

Suggested readings:

1. Kvasnica, J.: Teorie elektromagnetického pole. Academia Praha, 1985.
2. Landau, L. D., Lifšic, Je. M.: Úvod do teoretickej fyziky 1. Alfa Bratislava 1980.
3. Kvasnica, J.: Matematický aparát fyziky. Academia Praha, 1989.
4. Julius Adams Stratton: Electromagnetic Theory. IEEE Press, 2007.
5. Bécherrawy T.: Electromagnetism (Maxwell equations, Wave Propagation and Emission). Wiley, 2012.
6. Salák, M.: Video prednášky z teoretickej fyziky – Teória elektromagnetického poľa. CD záznam prednášok, Univerzitná knižnica PU v Prešove/CCKV PU, 2003.

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KZPRA2	**Title of Course:** Basic physical laboratory exercise 2
Type, scope and method of educational activities: Compulsory subject **Form of Study:** laboratory exercise **Number of contact hours:** 0/2 **per week:** 0/2 **per level/semester:** 0/26 **Student workload:** 90 hours **Direct education:** 20 hours **Self-study (exercise preparation):** 20 hours **Protocols preparation:** 40 hours **Protocols defence preparation:** 10 hours **Study method:** combined	
Number of credits: 3	
Semester: 5.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Evaluation during the semester • Theoretical preparation before the experiment (20%) Oral examination consists of two parts: • Evaluation of the elaborated protocols (50%) • Demonstration of the theoretical knowledge and practical competence (30%) Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Knowledge: - To master the basic principles of measurement and the theoretical background of physical phenomena connected with the content of the course - Master the basic methods of processing measured values Skills: - Control selected measuring instruments and measuring devices with the accent on safety - Reading the scatches or wiring diagrams and according to them to set-up the measuring setting or connect the circuit Competences: - Adapt theoretical knowledge to practical use and apply them in the implementation of experiments - Carry out a physical experiment and record the measured values.	

Syllabus/Indicative Content:

At the beginning of the semester, students are familiarized with the organization of the subject teaching and the principles of work safety in the laboratory, and then perform laboratory exercises from the list according to the schedule that is determined in the introduction.

List of measurements:

1. Measurement of electrical resistivity (resistances).
2. Measurement of I-V characteristics of conductors.
3. Determination of Faraday Constant.
4. Bridge and Substitution method for measurement of electrical resistance.
5. Measurement of electrical capacity using of AC method.
6. Measurement of the horizontal component of the Earth's magnetic field strength.
7. Measurement of Thermopower of the Thermocouple using of Compensation Method.
8. I-V characteristics measurement of the semiconductor diode using of uLAB system.
9. Thermal loss measurement using uLAB.
10. Determination of the basic parameters of an analogue measuring device and range extension.

Suggested readings:

1. Iľkovič, S.: Praktikum z fyziky I, II. FHPV PU Prešov 2008, ISBN 978-80-8068-721-2
2. Iľkovič, S., 2022. Merací systém uLAB, Prešovská univerzita v Prešov vo Vydavateľstve Prešovskej univerzity Prešov, ISBN 978-80-555-2965-3

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KJADFY	**Title of Course:** General Physics – Atomic and nuclear physics
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 2/0 **per week:** 2/0 **per level/semester:** 26/0 **Student workload:** 90 hours **Direct education:** 20 hours **Self-study:** 60 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 3	
Semester: 5.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Student during the semester • prepares feedback sheets (20%) Student on exam • demonstrate theoretical knowledge of the atomic and nuclear physics and demonstrate the analytical skills and knowledge of the mathematical apparatus in expressing quantitative relations of quantities (80%) Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: **Knowledge:** - Get an overview of the designation of quantities and symbols in the field of atomic and nuclear physics - Understand the basic relationships between quantities in the field of atomic and nuclear physics - Understand the principles of experimental methods in the field of atomic and nuclear physics - Master of the derivation of the important formulas using mathematical apparatus **Skills**: - Correctly transform units of quantities that occur in the studied area - Work with tables (periodic table of elements, isotope map, classification of elementary particles, etc.)	

- Work with a scientific calculator, resp. with the application in the mobile phone and on the PC (especially in connection with working with very small/large numbers)

Competences:
- Correctly interpret the conclusions of theories and experiments in the field of study
- Discuss the applications of atomic and nuclear physics in society
- Ability to take a position on the safety of the use of atomic and nuclear physics technologies and their impact on the environment
- Ability to follow the latest trends and discoveries in the field of atomic and nuclear physics, high energy physics and particle physics, or possibly cosmology.

Syllabus/Indicative Content:
Introduction to the Atomic Physics. Atomic structure of the matter and charge, atomic shell. Atomic hypothesis. Atom models. Alpha particles scattering on the Au foil. Molecule bindings. Introduction to the Nuclear Physics. History of the Nuclear Physics. Nuclei models. Radioactivity. Nuclear decay. Classification of the elementary particles. Cosmic rays and environment. Accelerators and detectors of the particles.

Suggested readings:

1. Daniš, S.: Atomová fyzika a elektronová struktúra látek, MatfyzPress, CUNI Praha, 2019
2. Úlehla, I. a kol.: Atomy, jádra, částice, Academia Praha 1990
3. Šterba F. a kol.: Atómová a jaderná fyzika, SPN, Praha, 1980
4. Beiser A.: Úvod do moderní fyziky, Academia, Praha, 1975
5. Oravec J.: Atómová a jadrová fyzika, UK, Bratislava, 1979
6. Савельев И. В. - Курс общей физики том 3 (Атомная физика, физика атомного ядра и элементарных частиц)
7. Das A. and Ferbel T.: Introduction to Nuclear and Particle Physics, WSP 2003
8. Vanovič J.: Všeobecná fyzika IV. –Atómová fyzika, Alfa, Bratislava a SNTL, Praha, 1980
9. Síleš E., Martinská G.: Všeobecná fyzika IV., časť I. a II., UPJŠ Košice 1985 (skriptá)
10. Kravčáková A., Vokál S., Vrláková J.: Všeobecná fyzika IV 1. časť: Atómová fyzika, UPJŠ Košice 2020 (vysokoškolský učebný text)

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KEVBIO	**Title Course: Evolutionary biology**
Type, scope, and method educational activities: Compulsory course **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester: 13/0** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number credits: 2	
Semester: 6th semester,	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Exam. Attendance at lectures (direct teaching) is compulsory. A student may have 1 absence excused based on a medical certificate and 1 absence unexcused. In case of more absences, the student will not be awarded credits. The final assessment takes the form of a test in which a minimum of 50% correct answers must be obtained. Grading criteria: A: 100–90 %; B: 89,9–80,0; C: 79,9–70,0; D: 69,9–60,0 %; E: 59,9 – 50,0; Fx: 49,9% and below.	
Aims and Objectives: Learning outcomes: **Knowledge acquired:** **The student will:** - understand basic technical terms in the field of evolutionary biology; - interpret the development and history of evolutionary theories and evolutionary thought; - explain the different stages in the evolutionary development of organisms. **Skills Acquired:** **Absent:** - investigate the adaptations of plants and animals to life in specific conditions, compare the shape, body parts of animals with respect to their way of life; - explain the main causes of evolution such as natural selection, sexual selection, speciation, mutation, genetic drift and draft; - investigate the diversity of present-day and fossil organisms; - compare common and distinct features of humans with other animal species and look for traits that indicate their biological relatedness; - compare and group animals and plants according to their degree of similarity/resemblance to each other; - compare current and extinct organisms, reflect on adaptation to the environment; - analyse the causes and consequences of biodiversity loss and ecosystem degradation, as well as appropriate remedial measures;	

- observe adaptations of plants and animals, including humans, using examples of model species;
- investigate the alert and camouflage colouration of different animal species and consider their importance for the survival of organisms in the environment;
- compare the colouration of males and females of different animal species, the colouration of juveniles and adults with respect to their efforts to survive in the environment;
- comparing the advantages and disadvantages of social and solitary living of animals.

Competencies acquired:

Graduate:

- can apply the acquired knowledge and skills;
- can take responsibility for the tasks and results of his/her work;
- has developed competences for further self-education;
- characterise the most modern evolutionary theories and explain them with concrete examples;
- argue in debates about the origin of life on the basis of the evidence for evolution;
- explore the diversity of organisms by identifying their common and distinct external features and ways of life;
- categorize organisms on the basis of observed common and distinct features;
- classify organisms according to relatedness and distinctive external features.

Syllabus/Indicative Content:

1. Introduction to evolution
2. History of evolutionary thought (from ancient times to the selfish gene)
3. The origin of life on Earth
4. Natural selection - postulates, Darwinism, Lamarckism, natural selection, gradualism, evolution of life
5. Sexual reproduction and asexual reproduction
6. Mutations, Genetic drift and draft
7. Speciation, Gene Migration
8. Macroevolutionary mechanisms - extinction, evolutionary trends, evolutionary novelty, phenotypic plasticity
9. Evidence for evolution
10. Evolution of the genus Homo
11. The selfish gene theory

Suggested readings:

Flégr, 2018. Evoluční biologie. Academia: Praha. 572 s.
Toman, 2020. Evoluce3. Academia: Praha. 312 s.
Zrzavý et al., 2017. Jak se dělá evoluce. Dokořán: Praha. 480 s.
Ševc, 2015. Evolučná biológia. Prešov: Prešovská univerzita. 79 s.

Language Instruction: Slovak language

Other course information: -

Grading history

Total number assessed students:

A	B	C	D	E	FX

Lecturer/Instructor:

prof. MVDr. Janka Poráčová, PhD., MBA, guarantor, lecturer, examiner
RNDr. Mária Konečná, PhD., lecturer, examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Maryichuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KSEMBP2	**Title of Course: Bachelor thesis seminar 2**
Type, scope, and method educational activities: Compulsory course **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 6th semester	
Degree/Level: 1. degree (Bachelor)	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Graduated. 1. Submission of an abstract with keywords within the bachelor's thesis in both Slovak and English. 2. Preparation of a presentation for the bachelor thesis defence, presenting the aims, methods and the most interesting parts of the bachelor thesis. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively. undergoes consultations. In case of unjustified absence or a larger number of absences, the student will not be granted credits, Mandatory ongoing consultations between the BP author and the trainer (at least 5 consultations, others if necessary), Prior to the actual implementation of the consultations, it is the student's obligation to submit the work project to the supervisor in printed form or by e-mail. In the project, the student will focus on the issues, theoretical background, goals, method of processing results in BP, If the student does not continuously consult the procedure, the results of his work with the tutor will not be awarded credits, At the end of the teaching part of the semester (no later than the last week) the student submits to the supervisor a preliminary working version of the bachelor's thesis, which will contain all the essentials of the bachelor's thesis in terms of content and form; at the tutor's suggestion, the subject will award credits to the student.	
Aims and Objectives: **Knowledge gained:** The student will be able to: - create a text with a logical and precise formulation of ideas, create a quality abstract, write an introduction, conclusion to an article, to the ZP respecting the requirements; - correctly use the various methods of citation and referencing, recording bibliographic references; - work with specialist literature (primary and secondary sources, search for information in book databases); - create (plan, process) a final thesis with all the necessary formalities in theoretical and practical terms.	

Skills acquired:
The student will be able to:
- correctly use the information from the PU Directive on the requirements of the final thesis,
- describe the content and form of the individual obligatory parts of the thesis,
- independently search for literature sources, work with them and cite them correctly according to the currently valid standards,
- independently elaborate the theoretical or practical part of the bachelor thesis,
- prepare an audiovisual presentation for the defence of the bachelor thesis.

Competences acquired:
The student is able to:
- be aware of the need and importance of observing the "academic bon ton". The student will be able to learn the importance of the "academic bonanza" (i.e. politeness, courtesy, tact) for his/her student life as well as for his/her future life as a teacher;
- observe the ethics of citation;
- express his/her beliefs and opinions directly and honestly;
- Recognise that the other party is also entitled to his/her own opinion;
- bear the consequences; accept responsibility for one's actions.

Syllabus/Indicative Content:
- Structure, scope and formal arrangement of the thesis.
- Changes in the Directive of the University of Prešov on the requirements of final theses.
-Content and form of the individual compulsory parts of the thesis.
-Practical examples and exercises for the correct writing of the bachelor thesis and preparation of the presentation of the thesis for the defence.
- Analysis of general requirements for the creation of the final thesis. Structure and content analysis and final work, analysis of used literature.
- Analysis of researched pedagogical phenomena in BP, used methods of data collection in ZP, analysis of used methods of quantitative and qualitative processing of ZP results.
- Preparation of the student for the defense of the bachelor's thesis.

Suggested readings:
1. Smernica Prešovskej univerzity o náležitostiach záverečných prác. 2013 [online]. Dostupné na: http://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica-2013.pdf
2. Usmernenie k písaniu a prezentácii záverečných prác Katedry biológie FHPV PU. 2013 [online]. Dostupné na: http://www.unipo.sk/fakulta-humanitnych-prirodnych-vied/katedry/biologia
3. Bernasovská J. a kol. 2020. Základy akademického písania záverečnch prác v biológii. Prešov: Vydavateľstvo Prešovskej university. ISBN: 978-80-555-2616-4.
4. Staroňová K. 2011: Vedecké písanie. Ako písať akademické a vedecké texty. Martin: Osveta. ISBN: 9788080633592
BENČO, J., 2001. Metodológia vedeckého výskumu. Bratislava: Iris. ISBN 80-89018-27-0.
DARÁK, M. a J. FERENCOVÁ, 2001. Metodológia pedagogického výskumu. Terminologické minimum. Prešov: ManaCon. ISBN80-89040-07-1.
DARÁK, M. a N. KRAJČOVÁ, 1995. Empirický výskum v pedagogike. Prešov: ManaCon. ISBN80-85668-22-X.
DE VITO, J. A., 2001. Základy mezilidské komunikace. Praha: Grada. ISBN 80-7169-988-8.
GONDA, V. 2012. Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition. ISBN 978-80-8078-472-0.
KATUŠČÁK, D., 1998. Ako písať vysokoškolské a kvalifikačné práce. Bratislava. ISBN 80-85697-82-3.
MAGNELLO, E. a B. VAN LOON, 2010. Seznamte se ... Statistika. Praha: Portál. ISBN 978-80-7367-753-4.

ONDREJKOVIČ, P., 2005. Úvod do metodológie sociálnych vied. Bratislava: Regent. ISBN 80-88904-35-8.
JUNGER, J., 2000. Diplomová práca. Interný metodický materiál FHPV PU. Prešov: FHPV.
MEŠKO, D., D. KATUŠČÁK, J. FINDRA a kol., 2005. Akademická príručka. Martin: Osveta. ISBN 80-8063-200-6.
PASTERNÁKOVÁ, L. 2020. Výcovné a vzdělávácí metody ve světě edukace. Týn nad Vltavou: Nová Forma. ISBN 978-80-7612-222-2.
PASTERNÁKOVÁ, L. 2014. Inovácie na FHPV PU v Prešove. In: Univerzita v kontexte zmien. Prešov: Vydavateľstvo Prešovskej univerzity. ISBN 978-80-555-1279-2. s. 569-572.

Language of Instruction: slovak language

Other course information: Compulsory subject, students enroll in the subject only once, from the approbation from which they write the bachelor's thesis.

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. RNDr. Marta Mydlárová Blaščáková, PhD.; seminar leader, gurantor
doc. Ing. Jozef Oboňa, PhD. seminar leader, gurantor

Last update: 4. March 2025

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KBIOPR	**Title of Course: Biological practice**
Type, scope, and method educational activities: Compulsory course **Form of Study:** seminars **Number of contact hours:** 13/0 **per week:** 1/0 **per level/semester: 13/0** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Recommended semester/trimester of study: 6th semester	
Degree/ Level: 1st degree (Bachelor)	
Prerequisites: -	
Requirements for taking the course: Graduated. Participation in a biological practicum, elaboration and presentation of a report directly on the field trip, the topic of which will be determined in agreement with the instructor. After the end of the excursion, processing of the excursion protocol. The overall grade will be awarded after fulfilling the above conditions with a minimum success rate of 50%. Unexcused absence from the field placement is assessed as a failure to meet the requirements for passing the course.	
Learning outcomes: **Knowledge acquired:** The student will: - has a clear understanding of conservation biology, understands its basic terminology; - is aware of the interdisciplinary nature of the subject; - is able to orientate himself/herself in the priorities of nature conservation and has an overview of both general and species-based nature conservation; - can analyse and synthesise the theoretical knowledge acquired in the profile and non-profile subjects General Botany, General Zoology, Ecology and Environmental Science, Plant Physiology, Animal and Human Physiology, Microbiology, Human Anatomy, General Genetics, Physical Geography and Geoecology, Evolutionary Biology with knowledge and personal experience from the field; - is able to solve assignments that require critical thinking and higher order thought operations in biology, ecology, and environmental science; - can form his/her own judgement on individual practical and theoretical problems related to nature. **Skills acquired:** Student: - is able to work effectively with biological material; - is able to work effectively with botanical and zoological keys and atlases; - is able to search for credible information and reliable sources; use fact-checking platforms; - is able to practically identify plants and animals in their natural habitats; and anthropogenically influenced habitats;	

- is able to master basic herbarization methodologies of plants and basic trapping methodologies of animals;
- is able to practically get acquainted with real problems in nature conservation - actively participate in the implementation of practical activities, e.g. State Nature Conservancy of the Slovak Republic, TANAP, Košice Zoo.

Acquired competences:

The student will be able to:

- organize a classroom team, acquires organizational competences;
- learns to express demands;
- express praise and criticism;
- work as a team;
- compromise;
- locate information and recognise plants and animals in field conditions;
- take an appropriate - positive attitude towards nature and landscape conservation.

Brief outline of the course:

Excursion (2 days)

Day 1: Excursion to selected protected areas in Slovakia. Case studies focused on specific solutions for the care of selected protected species of plants and animals. Demonstration of specific tools used in the management of protected areas and their presentation.

Day 2: Collection of plants for student herbaria with a demonstration of plant sampling (herbs and woody plants). Working with zoological material in the field - demonstrations of individual and bulk collecting. Exploration of animal communities of aquatic, wetland, non-forest, forest, urban and alpine habitats.

Alternatives: fauna of important biotopes of the world - Zoological Garden in Košice, Tropical and subtropical flora - Botanical Garden of UPJŠ in Košice.

Suggested readings

ČERNECKÝ J., GAJDOŠ P. et al. 2020: Hodnota ekosystémov a ich služieb na Slovensku. Štátna ochrana prírody SR, Banská Bystrica.

GÚGH J., TRNKA A., KARASKA D. & RIDZOŇ J. 2015: Zásady ochrany európsky významných druhov vtákov a ich biotopov. Štátna ochrana prírody SR, Banská Bystrica

Aktuálny zákon NR SR o ochrane prírody a krajiny a súvisiace vyhlášky MŽP SR

BUCHAR, J. a kol. Klíč k určování bezobratlých. Praha Scientia, 1995.

DOSTÁL, J. - ČERVENKA, M. Veľký kľúč na určovanie vyšších rastlín I. a II. Bratislava SPN, 1991-1992.

KRATOCHVÍL, J. a kol. Klíč zvířeny ČSR díl II. Třásnokřídlí, blanokřídlí, řasnokřídlí, brouci. Praha Nakladatelství Československé akademie věd, 1957.

KRATOCHVÍL, J. a kol. Klíč zvířeny ČSR díl III. Vzdušnicovci, drobnušky, mnohonožky, stonožky, hmyzenka, chvostoskok, vidličnatky, šupinušky, jepice, pošvatky, vážky, rovnokřídlí, kudlanky, švábi, škvoři, pisivky, všenky, vši, ploštice, stejnokřídlí, střechatky, dlouhošíjky, síťokřídlí, srpice, chrostíci, blechy a motýli. Praha Nakladatelství Československé akademie věd, 1959.

KREJČA, J. Veľká kniha rastlín. Bratislava Príroda, 1993.

MAJZLAN, O. - KRUMPÁL, M. Článkonožce – Arthropoda: Zoologická príručka. Bratislava Prírodovedecká fakulta UK, 1990.

MARHOLD, K. - HINDÁK, F. Zoznam nižších a vyšších rastlín Slovenska. Bratislava VEDA, 1998.

MARTINOVSKÝ, J. a kol. Kľúč na určovanie rastlín. Bratislava SPN, 1987.

MIKLÓS, P. a kol. Určovací kľúč stavovcov Západných Karpát. Bratislava Faunima, 2008.

ŠNÍREROVÁ T., FELDEKOVÁ Ľ. Naša príroda : živočíchy a rastliny strednej Európy. Vydavateľstvo Tarsago Slovensko, Bratislava, 2016, 1. vydanie. ISBN 978-80-8097-232-5.

TULENKOVÁ M., ŠUTIAKOVÁ I. Vybrané kapitoly z cytológie rastlín a živočíchov. Vydavateľstvo PU, Prešov, 2015, 1. vydanie. ISBN 978-80-555-1376-8.

Language required for the course: Slovak language

Other course information:-

Garding history

Total number of students assessed:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Marta Mydlárová Blaščáková, PhD. – seminar leader, examiner
doc. MVDr. Soňa Mačeková, PhD. – seminar leader, examiner
doc. RNDr. Eva Petrejčíková, PhD. – seminar leader, examiner
doc. RNDr. Dana Dojčáková, PhD. – seminar leader, examiner
doc. RNDr. Vincent Sedlák, PhD. – seminar leader, examiner
RNDr. Michaela Zigová, PhD. – seminar leader
RNDr. Jana Gaľová, PhD. – seminar leader
RNDr. Daniela Hegedűš Grejtáková, PhD. – seminar leader
doc. RNDr. Alexander Csanády, PhD. – seminar leader
doc. RNDr. Daniela Gruľová, PhD. – seminar leader
prof. MVDr. Janka Poráčová, PhD., MBA – seminar leader
doc. Ing. Jozef Oboňa, PhD. – seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/ZELCHEM	**Title of Course:** Green chemistry
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture, seminar **Number of contact hours:** 3 **per week:** 2+1 **per level/semester:** 39 **Student workload:** 90 hours **Direct education:** 30 hours **Self-study:** 40 hours **Guided work:** 20 hours **Study method:** combined	
Number of credits: 3	
Semester: 6.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous examination on seminars - 30 %. Final exam - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: After completing the course, the student: Acquired knowledge: Student: - will know the principles of green chemistry and sustainable development; - have an overview of new trends in current "green" technologies in industry; - acquires knowledge about green alternatives to dirty chemical production, fossil fuels, solvents. Acquired skills: Student: - will master basic chemometric calculations in green chemistry; - will be able to compare the environmental impact of chemical reactions. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally;	

- can work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:

Principles of sustainable development and green chemistry. Green chemistry and industry. Waste minimization. Green chemistry and sustainable development. Green chemistry and sustainability parameters. Chemometric calculations for determining the environmental impact of chemical reactions. Life cycle assessment to identify more sustainable products and processes. Industrial processes using solid acid catalysts. She calculated greenly. Supercritical extraction. Ionic liquids. Biocatalysis. Green catalysts for industry. Hydrogen peroxide to minimize waste. Green chemistry in practice. Intensification processes in green chemistry. Green synthesis of nanomaterials.

Suggested readings:

1. J.H. Clark and D. MacQuarrie. Handbook of Green Chemistry and Tecgnology. 2002, ISBN: 0632057157. 560p.
2. M. Lancaster. Green Chemistry. 2010, ISBN: 0854046208, 310 P.
3. P.T. Anastas, Chao-Jun Li. Handbook of Green Chemistry. Vol. 1-5: 2010, ISBN:3527315748. 410 p.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KSEMBP2	**Title of Course:** Bachelor thesis seminar 2
Type, scope, and method educational activities: Compulsory subject **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 6th semester	
Degree/Level: 1. degree	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Graduated. 1. Submission of an abstract with keywords within the bachelor's thesis in both Slovak and English. 2. Preparation of a presentation for the bachelor thesis defence, presenting the aims, methods and the most interesting parts of the bachelor thesis. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively. undergoes consultations. In case of unjustified absence or a larger number of absences, the student will not be granted credits, Mandatory ongoing consultations between the bachelor thesis author and the trainer (at least 5 consultations, others if necessary), Prior to the actual implementation of the consultations, it is the student's obligation to submit the work project to the supervisor in printed form or by e-mail. In the project, the student will focus on the issues, theoretical background, goals, method of processing results in bachelor thesis, If the student does not continuously consult the procedure, the results of his work with the tutor will not be awarded credits, At the end of the teaching part of the semester (no later than the last week) the student submits to the supervisor a preliminary working version of the bachelor's thesis, which will contain all the essentials of the bachelor's thesis in terms of content and form; at the tutor's suggestion, the subject will award credits to the student.	
Aims and Objectives: **Knowledge gained:** The student will be able to: - create a text with a logical and precise formulation of ideas, create a quality abstract, write an introduction, conclusion to an article, to the bachelor thesis respecting the requirements; - correctly use the various methods of citation and referencing, recording bibliographic references;	

- work with specialist literature (primary and secondary sources, search for information in book databases);
- create (plan, process) a final thesis with all the necessary formalities in theoretical and practical terms.

Skills acquired:

The student will be able to:
- correctly use the information from the PU Directive on the requirements of the final thesis,
- describe the content and form of the individual obligatory parts of the thesis,
- independently search for literature sources, work with them and cite them correctly according to the currently valid standards,
- independently elaborate the theoretical or practical part of the bachelor thesis,
- prepare an audiovisual presentation for the defence of the bachelor thesis.

Competences acquired:

The student is able to:
- be aware of the need for and importance of observing the "academic bon ton". The student will be able to learn the importance of the "academic bonanza" (i.e. politeness, courtesy, tact) for his/her student life as well as for his/her future life as a teacher;
- observe the ethics of citation;
- express his/her beliefs and opinions directly and honestly;
- Recognise that the other party is also entitled to his/her own opinion;
- bear the consequences; accept responsibility for one's actions.

Syllabus/Indicative Content:

- Structure, scope and formal arrangement of the thesis.
- Changes in the Directive of the University of Prešov on the requirements of final theses.
-Content and form of the individual compulsory parts of the thesis.
-Practical examples and exercises for the correct writing of the bachelor thesis and preparation of the presentation of the thesis for the defence.
- Analysis of general requirements for the creation of the final thesis. Structure and content analysis and final work, analysis of used literature.
- Analysis of researched pedagogical phenomena in BP, used methods of data collection in bachelor thesis, analysis of used methods of quantitative and qualitative processing of bachelor thesis results.
- Preparation of the student for the defense of the bachelor's thesis.

Suggested readings:

1. Smernica PU o náležitostiach záverečných prác, ich bibliografickej registrácii, kontrole originality, uchovávaní a sprístupňovaní. 2019 [online]. Dostupné na: https://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica2019.pdf
2. Staroňová K. 2011: Vedecké písanie. Ako písať akademické a vedecké texty. Martin: Osveta. ISBN: 9788080633592
3. Benčo, J., 2001. Metodológia vedeckého výskumu. Bratislava: Iris. ISBN 80-89018-27-0.
4. Darák, M. a J. Ferencová, 2001. Metodológia pedagogického výskumu. Terminologické minimum. Prešov: ManaCon. ISBN80-89040-07-1.
5. Darák, M. a N. Krajčová, 1995. Empirický výskum v pedagogike. Prešov: ManaCon. ISBN80-85668-22-X.
6. De Vito, J. A., 2001. Základy mezilidské komunikace. Praha: Grada. ISBN 80-7169-988-8.
7. Gonda, V. 2012. Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition. ISBN 978-80-8078-472-0.

8. Katuščák, D., 1998. Ako písať vysokoškolské a kvalifikačné práce. Bratislava. ISBN 80-85697-82-3.
9. Magnello, E. a B. van Loon, 2010. Seznamte se ... Statistika. Praha: Portál. ISBN 978-80-7367-753-4.
10. Ondrejkovič, P., 2005. Úvod do metodológie sociálnych vied. Bratislava: Regent. ISBN 80-88904-35-8.

Language of Instruction: Slovak language

Other course information: Compulsory subject, students enroll in the subject only once, from the approbation from which they write the bachelor's thesis.

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc.
RNDr. Romana Smolková, PhD.

Last update: 16. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KASTRO	**Title of Course:** Astronomy
Type, scope and method of educational activities: Compulsory subject **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Student workload:** 60 hours **Direct education:** 10 hours **Self-study:** 40 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 6.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Exam.	
Aims and Objectives: **Acquired knowledge:** - The student will become familiar with the basic methods of determining the position in space, the basic laws of celestial mechanics, the latest knowledge of the solar system and planetary cosmogony. **Acquired skills:** - The acquired knowledge will be able to prepare presentations for classes **Acquired competences:** - Apply acquired knowledge in practice and during teaching.	
Syllabus/Indicative Content: Basics of orientation in the sky, apparent motion of planets - spherical astronomy - astronomical coordinate systems and their corrections - aberration, parallax, precession and nutation, refraction, natural motion of stars - celestial mechanics - Kepler's laws - orbit geometry, speed and position on orbit - Kepler's equation, orbital elements - the problem of two and three bodies - Lagrange's libration points - disturbances in the orbits of solar system bodies. physics of the Sun - structure, its activity, physics of planets and interplanetary matter, cosmogony of the solar system.	
Suggested readings: 1. Vanýsek, V.: Základy astronómie a astrofyziky, Praha, NČAV 1980 2. Hajduk A.: Encyklopédia astronómie, bratislava, Obzor, 1987 3. Aktuálna časopisecká literatúra KOZMOS	

Language of Instruction: *slovak*

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. Mária Csatáryová, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KSEMBP2	**Title of Course:** Bachelor thesis seminar 2
Type, scope, and method educational activities: Compulsory course **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 6	
Degree/Level: 1.	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Graduated. 1. Submission of an abstract with keywords within the bachelor's thesis in both Slovak and English. 2. Preparation of a presentation for the bachelor thesis defence, presenting the aims, methods and the most interesting parts of the bachelor thesis. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively. undergoes consultations. In case of unjustified absence or a larger number of absences, the student will not be granted credits, Mandatory ongoing consultations between the BP author and the trainer (at least 5 consultations, others if necessary), Prior to the actual implementation of the consultations, it is the student's obligation to submit the work project to the supervisor in printed form or by e-mail. In the project, the student will focus on the issues, theoretical background, goals, method of processing results in BP, If the student does not continuously consult the procedure, the results of his work with the tutor will not be awarded credits, At the end of the teaching part of the semester (no later than the last week) the student submits to the supervisor a preliminary working version of the bachelor's thesis, which will contain all the essentials of the bachelor's thesis in terms of content and form; at the tutor's suggestion, the subject will award credits to the student.	
Aims and Objectives: **Knowledge gained:** The student will be able to: - create a text with a logical and precise formulation of ideas, create a quality abstract, write an introduction, conclusion to an article, to the ZP respecting the requirements; - correctly use the various methods of citation and referencing, recording bibliographic references; - work with specialist literature (primary and secondary sources, search for information in book databases);	

- create (plan, process) a final thesis with all the necessary formalities in theoretical and practical terms.

Skills acquired:

The student will be able to:

- correctly use the information from the PU Directive on the requirements of the final thesis,
- describe the content and form of the individual obligatory parts of the thesis,
- independently search for literature sources, work with them and cite them correctly according to the currently valid standards,
- independently elaborate the theoretical or practical part of the bachelor thesis,
- prepare an audiovisual presentation for the defence of the bachelor thesis.

Competences acquired:

The student is able to:

- be aware of the need and importance of observing the "academic bon ton". The student will be able to learn the importance of the "academic bonanza" (i.e. politeness, courtesy, tact) for his/her student life as well as for his/her future life as a teacher;
- observe the ethics of citation;
- express his/her beliefs and opinions directly and honestly;
- Recognise that the other party is also entitled to his/her own opinion;
- bear the consequences; accept responsibility for one's actions.

Syllabus/Indicative Content:

- Structure, scope and formal arrangement of the thesis.
- Changes in the Directive of the University of Prešov on the requirements of final theses.
-Content and form of the individual compulsory parts of the thesis.
-Practical examples and exercises for the correct writing of the bachelor thesis and preparation of the presentation of the thesis for the defence.
- Analysis of general requirements for the creation of the final thesis. Structure and content analysis and final work, analysis of used literature.
- Analysis of researched pedagogical phenomena in BP, used methods of data collection in ZP, analysis of used methods of quantitative and qualitative processing of ZP results.
- Preparation of the student for the defense of the bachelor's thesis.

Suggested readings:

Smernica Prešovskej univerzity o náležitostiach záverečných prác. 2013 [online]. Dostupné na: http://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica-2013.pdf

Staroňová K. 2011: Vedecké písanie. Ako písať akademické a vedecké texty. Martin: Osveta. ISBN: 9788080633592

BENČO, J., 2001. Metodológia vedeckého výskumu. Bratislava: Iris. ISBN 80-89018-27-0.

DARÁK, M. a J. FERENCOVÁ, 2001. Metodológia pedagogického výskumu. Terminologické minimum. Prešov: ManaCon. ISBN80-89040-07-1.

DARÁK, M. a N. KRAJČOVÁ, 1995. Empirický výskum v pedagogike. Prešov: ManaCon. ISBN80-85668-22-X.

DE VITO, J. A., 2001. Základy mezilidské komunikace. Praha: Grada. ISBN 80-7169-988-8.

GONDA, V. 2012. Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition. ISBN 978-80-8078-472-0.

KATUŠČÁK, D., 1998. Ako písať vysokoškolské a kvalifikačné práce. Bratislava. ISBN 80-85697-82-3.

MAGNELLO, E. a B. VAN LOON, 2010. Seznamte se ... Statistika. Praha: Portál. ISBN 978-80-7367-753-4.
ONDREJKOVIČ, P., 2005. Úvod do metodológie sociálnych vied. Bratislava: Regent. ISBN 80-88904-35-8.
JUNGER, J., 2000. Diplomová práca. Interný metodický materiál FHPV PU. Prešov: FHPV.
MEŠKO, D., D. KATUŠČÁK, J. FINDRA a kol., 2005. Akademická príručka. Martin: Osveta. ISBN 80-8063-200-6.
PASTERNÁKOVÁ, L. 2020. Výcovné a vzdělávácí metody ve světě edukace. Týn nad Vltavou: Nová Forma. ISBN 978-80-7612-222-2.
PASTERNÁKOVÁ, L. 2014. Inovácie na FHPV PU v Prešove. In: Univerzita v kontexte zmien. Prešov: Vydavateľstvo Prešovskej univerzity. ISBN 978-80-555-1279-2. s. 569-572.

Language of Instruction: slovak language

Other course information: Compulsory subject, students enroll in the subject only once, from the approbation from which they write the bachelor's thesis.

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
Dr. h. c. doc. PaedDr. Vladimír Šebeň, PhD., seminar leader, gurantor

Last update: 4. March 2025

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KOBHZP	**Title of Course:** Bachelor thesis defense
Type, scope and method of educational activities: **Form of Study:** **Number of contact hours:** **per week:** **per level/semester:** **Student workload:** **Direct education:** **Self-study:** **Guided work:** **Study method:**	
Number of credits: 10	
Semester: 6.	
Degree/Level: 1.	
Prerequisites:	
Grading Policy (Assessment/Evaluation): Method of evaluation and completion of study of the subject: Interim assessment: • When preparing the bachelor's thesis, the student follows the instructions of his supervisor and the Directive on the requirements of the final theses, their bibliographic registration, control of originality, storage and access issued by the University of Prešov in Prešov. The scope of work can be determined by the training workplace, while the recommended scope is 30 to 40 standard pages (54,000-72,000 characters) without appendices (from introduction to conclusion inclusive). The structure of the work and the formal arrangement of the work is determined by agreement with the supervisor in the Directive on the requirements of final theses. The final variant of the bachelor's thesis, bound in hardcover, will be submitted by the student to the department that listed the topic of the thesis. The deadline for submitting bachelor's theses is set in the schedule of the relevant academic year. • The bachelor's thesis is submitted in two printed copies, its electronic version, which must be identical to the printed version, is inserted by the student into the final theses registration system in PDF format, no later than seven days after submitting the printed version. The originality of the work is assessed in the central register of theses. A report on the originality of the final thesis is drawn up on the result of the originality check. Checking originality is a necessary condition for defense. Based on the result of overlapping work with other works, the supervisor decides whether the work can be the subject of a defense. • Part of the submission of the work is the conclusion of a license agreement on the use of the digital reproduction of the work between the author and the Slovak Republic on behalf of the university. After submitting the work to the EZP PU, the author immediately submits to the training workplace a draft license agreement signed by him, which must be signed by an authorized representative of the university (a senior employee of the training workplace) within 30 days of sending the work to the CRZP. • The bachelor's thesis is assessed by the thesis supervisor and the opponent, who prepare assessments according to the established criteria.	

The Commission for State Final Examinations will evaluate the progress of the defense in a closed session and decide on the classification. During the classification, it comprehensively assesses the quality of the work and its defense, taking into account the opinions and the progress of the defense, and evaluates it with one common mark. The resulting evaluation may be the same as in the reviews, but it may also be better, or worse, depending on the progress of the defense. The decision on the result of the defense will be announced publicly by the chairman of the commission together with the result of the relevant state final exam.
Final evaluation: Defense of the bachelor's thesis. State exam.

Aims and Objectives:
Acquired knowledge:
The student can:
- independently and creatively use professional sources;
- analyze and evaluate the current state of the problem;
Acquired skills:
The student can:
- synthesize and apply acquired theoretical knowledge in the bachelor's thesis;
- present and defend your position in terms of the goal of the work and its contribution.
Acquired competences:
The student can:
- demonstrate your language and professional culture;
- express your own attitude towards the professional problems of your studies.

Syllabus/Indicative Content:
The bachelor's thesis defense has a regular course:
1. Opening speech of the graduate, presentation of the results of the final thesis.
2. Presentation of the main points from the written assessments of the trainer and the opponent.
3. The student's answers to the questions of the trainer and the opponent.
4. Professional debate on the bachelor's thesis with questions for the student.
The bachelor thesis is available to the committee during the defense. The introductory word should contain primarily the following points:
1. Brief justification of the choice of topic, its topicality, practical benefit.
2. Clarification of the goals and methods used in processing the work.
3. The main content problems of the work.
4. Conclusions and practical recommendations reached by the author of the work.
During the presentation, the student has at his disposal his own copy of the bachelor's thesis, or a written introductory presentation. He will deliver the speech separately. Can use computer technology. The opening speech should be short, it should not exceed ten minutes.

Suggested readings:
GAVORA, P.: Úvod do pedagogického výskumu. Bratislava: Univerzita Komenského, 1999. ISBN 80-223-1342-4.
GONDA, V.: Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava: Iura Edition, spol.s.r.o. ISBN 978-80-8078-472-0.
KATUŠČÁK, D.: Ako písať vysokoškolské a kvalifikačné práce. Ako písať seminárne práce, ročníkové práce, práce ŠVOČ, diplomové práce, záverečné a atestačné práce a dizertácie. Bratislava: Stimul, 1998.ISBN 80-85697-57-2.
ŠVEC, Š. a kol.: Metodológia vied o výchove. Bratislava: IRIS, 1998. ISBN 80-88778-73-5.

VIŠŇOVSKÝ, Ľ., ZOLYOMIOVÁ, P., BRINCKOVÁ, J.: Metodika diplomovej práce. 2007. ISBN 978-80-8083-374-9.
Smernica o náležitostiach záverečných prác, ich bibliografickej registrácii, kontrole originality, uchovávaní a sprístupňovaní. [online]. Prešov: PU. [cit.17.12.2021]. Dostupné z: http://www.pulib.sk/web/data/pulib/subory/stranka/ezp-smernica-2019.pdf

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc.
prof. RNDr. Marián Reifffers, DrSC.
doc. RNDr. Marta Mydlárová Blaščáková, PhD.
doc. RNDr. Sergej Iľkovič, PhD.
doc. Ing. Jozef Oboňa, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KSSCAP	**Title of Course:** Man and nature
Type, scope and method of educational activities: Compulsory subject **Form of Study:** **Number of contact hours:** **per week:** **per level/semester:** **Student workload:** **Direct education:** **Self-study:** **Guided work:** **Study method:**	
Number of credits: 4	
Semester: 6.	
Degree/Level: 1.	
Prerequisites: *General chemistry*	
Grading Policy (Assessment/Evaluation): Method of evaluation and completion of study of the subject: **Interim assessment:** Conditions for completing the subject: The final exam can be taken by a student who has fulfilled the obligations set out in the study program during the examination of the study carried out in the last year of study. The final exam will be conducted in the form of a colloquium and the student will be graded from A to FX. The grade will be included in the overall evaluation of the state exam. The evaluation based on the oral examination will be carried out according to the classification scale, which consists of six classification levels: A – excellent (excellent results: numerical value 1), B – very good (above average results: 1.5), C – good (average results: 2), D – satisfactory (acceptable results: 2.5), E – sufficient (results meet the minimum criteria: 3), FX - insufficient (additional work required: 4). The main evaluation criteria are: - depth of acquired knowledge, ability to apply acquired knowledge in practice, independent and logical thinking supported by expressive skills. **Final evaluation:** State exam	
Aims and Objectives: Acquired knowledge: The student can: - define the characteristics of the selected areas of Biology, Chemistry and Physics; - orient yourself in the individual profile subjects of Biology, Chemistry and Physics; - use theoretical knowledge and their synthesis within profile subjects; - define and interpret in your own words the basic terms of biology, physics and chemistry; - has developed natural science ideas about selected natural phenomena and processes. - within the framework of communication, obtain and subsequently communicate data arranged in various systematized files (tables, graphs, diagrams, etc.).	

Acquired skills:
The student can:
- synthesize knowledge and apply it in practice
- think independently and develop theoretical as well as practical experience from profile subjects,
- get to know the environment and the changes that are happening in it independently/in groups,
with an emphasis on the identification of contexts,
- possess the skills of scientific work. To propose simple procedures for an objective and systematic investigation of the surrounding world, within which research questions are identified, to make assumptions about the research question and justify them adequately on the basis of previous knowledge. Implement the proposed research procedure, record the data and formulate a conclusion. Appropriate use of relevant mathematical apparatus and available technologies
- apply acquired natural science knowledge in solving new local and global challenges. At the same time, use appropriate (technical) equipment in the process of natural science learning
Acquired competences:
The student can:
- classify and erudite work in the field of man and nature;
- apply diverse methods, procedures and strategies in their subject;
- eruditely argue your own professional opinions;
- the student can communicate adequately; work independently with professional literature;
- demonstrate language culture, independent attitude, ability to self-reflect.
- discuss selected natural science phenomena and objects, argue and change your ideas and explanations due to argumentation.
- search for missing information in various information sources and consider their credibility.
- perceive the results of your research/teaching activity as a reliable source of information.
- have basic ideas about scientific procedures and apply them in their own learning process. Understand that science constitutes knowledge, with explanations, theories, and models expressing the understanding that best corresponds to the research results known at the time.

Syllabus/Indicative Content:
1. Biology: profile subjects within the field of biology.
2. Chemistry: profile subjects within the field of chemistry.
3. Physics: profile subjects within the field of physics.

Suggested readings:
POSPÍŠIL, M.F. 2002. Biológia človeka 1. Univerzita Komenského, ISBN: 80-223-1542-7.
PARKER,S. 2008. Ľudské telo.256 s. Ikar a.s. Bratislava. ISBN 978-80-551-1731-7
SINĚĽNIKOV, R.D. 1970. Atlas anatómie člověka. Avicenum, Praha.
BAČKOR, M.: Základy systému nižších rastlín I. UPJŠ Košice, 2002, 140 s.
KALINA, T. – VÁŇA, J.: Sinice, řasy, houby mechorosty a podobné organismy v současné biologii. 1. vyd. Universita Karlova v Praze: Nakladatelství Karolinum, 2005, 606 s., ISBN 80-2461036-1Malina R.: Všeobecná zoológia. FPV, BB, 2004. 95 s.
Bocáková M.: Obecná zoologie pro učitele. Vyd. UP v Olomouci, 2009, 77s . ISBN 978 - 80-244-2275-6

Majzlan, O. Glváč, M.: Zoológia, 2002, 275 s. ISBN 80-968535-4-6.
KAŠPAR, E. 1978. Didaktika fyziky. SPN Praha.
FUKA, J. 1986. Didaktika fyziky. Skriptum, UP Olomouc.1986.
HALLIDAY, D. - R. RESNICK - J. WALKER, 2000. Fyzika. Vysokoškolská učebnice fyziky. Praha: Nakladatelství PROMETHEUS. ISBN 978-80-7367-314-7.
ČIČMANEC, P. a kol. 1980. Všeobecná fyzika 2. Elektrina a magnetizmus. Praha: SNTL. Bratislava: ALFA. ISBN 63-560-80.
KREMPASKÝ, J. 1988. Fyzika. Bratislava: ALFA 1988.
HAJKO, V. - SZABÓ, D. J. 1983. Základy fyziky. Bratislava: VEDA. ISBN 63-144-83.
Gažo J. a kol.: Všeobecná a anorganická chémia, Alfa, Bratislava 1981.
P. Atkins: Fyzikála chémia STU Bratislava 1999
Žúrková, Ľ. a kol.: Všeobecná chémia. 1. vyd. Bratislava: SPN, 1985.
P. Hrnčiar: Organická chémia, UK Bratislava, 1997.
J. Garaj a kol.: Analytická chémia, SNTL/ALFA, Bratislava 1987

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc.
prof. RNDr. Marián Reifffers, DrSC.
doc. RNDr. Marta Mydlárová Blaščáková, PhD.
doc. RNDr. Sergej Iľkovič, PhD.
doc. Ing. Jozef Oboňa, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMAPR2	**Title of Course:** Mathematics for natural scientists 2
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 1	
Semester: 2nd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Acquired knowledge: A graduate of this subject can: - understand the meaning of terms from matrix calculus - understand the meaning of concepts from the field of infinite orders - understand the meaning of concepts from the field of complex numbers - learn to modify matrices using elementary row (column) operations - to learn basic relations for sums of some infinite orders - learn to convert complex numbers into different forms Acquired skills: A graduate of this subject can: - use editing algorithm procedures when solving examples - apply acquired mathematical skills in solving natural science problems Acquired competences: A graduate of this subject can: - determine the type of task and propose a solution procedure - solve natural science problems using the acquired mathematical apparatus - connect mathematical skills from different areas of natural sciences	
Syllabus/Indicative Content: System of linear equations (substitution and addition method) - Matrices, determinants (Gauss elimination method) - Infinite number series (concept, convergence and sum, convergence criteria, absolute convergence) - Basic properties of complex numbers,	

component form of complex numbers. Trigonometric form of complex numbers. Exponential form of complex numbers - Fundamentals of analytic geometry.

Suggested readings:

1. Brajerčík, J., Demko, M.: Matematika pre študentov prírodovedných odborov (biológia-ekológia-geografia), 1. časť. Elektronický učebný text. Prešovská univerzita v Prešove, 2018
2. Brajerčík J., Majherová M., Litecká J.: Matematika pre študentov prírodovedných odborov 2. Časť (Biológia - Ekológia - Fyzika - Geografia - Technika), Elektronický učebný text. Prešovská univerzita v Prešove, 2023
3. Míka,S.: Numerické metódy algebry, SNTL, Praha, 1985
4. Trávníček S., Calábek P., Švrček J., Matematická analýza I a II : (pro učitelské obory), Univerzita Palackého v Olomouci, 2014, ISBN 978-80-244-4117-7
5. Buša, Schrötter: Komplexné čísla

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: RNDr. Ivan Čurlík, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov

Faculty: Faculty of Humanities and Natural Sciences

Code: 2FYZ/KHISAS | **Title of Course:** History of Astronomy

Type, scope and method of educational activities: Compulsory Elective course
Form of Study: Lecture
Number of contact hours: 1/0
per week: 1/0
per level/semester: 13/0
Study method: combined
Student workload: 30 hours
Direct education: 10 hours
Self-study: 20 hours

Number of credits: 1

Semester: 2nd semester

Degree/Level: 1st degree (Bachelor)

Prerequisities: -

Grading Policy (Assessment/Evaluation): Continuous evaluation/Exam.
Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.

Aims and Objectives:
Acquired knowledge:
- The student will become familiar with the basic methods of determining the position in space, the basic laws of celestial mechanics, the latest knowledge of the solar system and planetary cosmogony.

Acquired skills:
- The acquired knowledge will be able to prepare presentations for classes

Acquired competences:
- Apply acquired knowledge in practice and during teaching

Syllabus/Indicative Content:
The first records of observations of the ancients. Ancient astronomy. Ptolemy geocentrizmus. Astronomy in the Middle Ages. Copernicus heliocentrizmus. Kepler's laws. Astronomy in the Renaissance period, Celestial Mechanics Principles of stellar astronómie.Astronómia in the early 20th century - extra-galactic astronomy, cosmology. The historical development of astronomy in Slovakia.

Suggested readings:

1. Štefl,V.,Krtička, J. Historie astronomie. Masarykova Univerzita, Brno 2008
2. Druga, L. Úvod do dejín astronómie, SÚH, Hurbanovo 1995
3. Časopisecká literatúra – Kozmos

Language of Instruction: Slovak language

Other course information:

Grading history
Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: doc. RNDr. Mária Csatáryová, PhD.
Last update: 30 September 2024
Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KMIKRO	**Title of Course: Microbiology**
Type, scope and method of educational activities: Compulsory elective course **Form of Study:** lecture, laboratory exams **Number of contact hours:** 1/1 **per week:** 1/1 **per level/semester:** 13/13 **Study method:** combined **Student workload: 60 hours** Direct education: 20 hours Self-study: 20 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 3rd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Participation in lectures and laboratory exercises is mandatory for successful completion of the course. The final assessment will be in the form of a written examination in the form of laboratory exercises, which will be based on the material covered. Passing the written examination is based on obtaining at least 50% of the total number of points. A condition for successful completion of the course is also the preparation and submission of the laboratory exercise reports according to the teacher's instructions. The evaluation of the laboratory exercises will represent 20 % of the course grade. The remainder of the assessment will be a written examination of the lectures. Grades A: 100 – 90%, B: 89 – 80%, C: 79 – 70%, D: 69 – 60%, E: 59 – 50%. Attendance at lectures and laboratory exercises is compulsory. A student may have up to 2 absences excused on the basis of a doctor's certificate. For absences, the student will be given make-up assignments or attend a tutorial. In case of unexcused absences or a greater number of absences, no credit will be awarded to the student.	
Aims and Objectives: **Knowledge gained:** The student will be able to: - Define and interpret basic concepts of microbiological terminology in their own words; - describe the characteristics of living organisms and characterize the differences between a prokaryotic cell and different types of eukaryotic cells; - characterise non-cellular microbes - viruses, viroids; - correctly describe the different shapes and arrangements of bacterial cells and their division; - describe the structure of the bacterial cell - its organelles and the chemical composition of the cell wall of G+ and G- bacteria; - correctly classify and describe microorganisms according to their mode of nutrition, depending on pH, oxygen, energy; - characterize the growth stages of bacterial culture, the effect of temperature, pH and pressure on the growth of bacteria; - define the effects of external factors on bacteria and the various methods of controlling microorganisms;	

- correctly describe genetic replication, transcription, translation, genetic code;
- describe the mechanisms allowing microorganisms to enter and invade the host, damage to host cells;
- explain the importance of the pathogenicity of bacteria and the pathogenic properties of viruses;
- describe the basic genera and species of bacteria - medical significance, occurrence, laboratory diagnosis;
- characterise the importance of yeasts, moulds, fungi - their specification and morphology, division, significance, or what diseases they cause;
- describe the mutual relationships between organisms or microorganisms with each other; - explain the concept of ecosystem (divide and characterize ecosystems in terms of microbiology), microbiocenosis, symbiosis between organisms.

Skills acquired:

The student will be able to:
- perform basic laboratory operations and work with laboratory equipment and laboratory techniques;
- safely handle biological material (bacterial cultures);
- independently solve practical tasks in microbiology.

Competences acquired:

The student will be able to:
- apply the acquired knowledge in solving assigned practical tasks in microbiology;
- create a record (protocol) of the practical task, correctly evaluate and justify its results;
- understand interrelationships, look for interrelationships;
- make independent and responsible decisions;
- solve problems, interpret facts, propose solutions, present and argue the results of practical tasks;
- demonstrate acquired knowledge, skills, and abilities to enable further study and to apply them in pedagogical practice.

Syllabus/Indicative Content:

The subject and importance of microbiology. Division of microbiology and its relationship to other sciences. Classification of microorganisms.

History of microbiology - development of microscope, propagation of self-fertilization, theory of spontaneous origin of life, microorganisms as agents of disease.

Morphology and anatomy of the bacterial cell. Basic shapes and size of bacterial cells. Biofilm.

Division of microorganisms according to their mode of nutrition. Chemical composition of bacterial cells. Growth and multiplication of bacteria. Syntrophy.

Control of growth of microorganisms - physical, chemical and biological factors.

Metabolism of bacteria - general principles. Anabolism and catabolism. Role of ATP. Role of enzymes. Oxidation-reduction processes.

Genetics of bacteria - structure and function of genetic material. Replication of genetic information. Transcription and translation of genetic information.

Pathogenicity factors. Plasmids, bacteriophages and bacterial pathogenicity.

Medically important microorganisms - taxonomic classification, characteristics, most important representatives, laboratory diagnostics.

Yeasts and moulds - characteristics, significance, reproduction, life cycle.

Ecosystems of microorganisms - characteristics, distribution, significance

Symbioses between microorganisms

Suggested readings:

Javoreková, S., Maková, J. 2019. Mikrobiológia. Nitra: SPU. 137 s. ISBN 978-80-552-2113-7.
Tkáčiková, Ľ., Mydlárová Blaščáková, M. 2015. Molekulová mikrobiológia. Prešov: PU FHPV. 168 s. ISBN 978-80-555-1485-7.
Bobuľská, L. 2021. Mikrobiálna ekológia. Prešov: Vydavateľstvo Preovskej university. ISBN 978-80-555-2712-3.
Hudecová, D., Šimkovič, M. 2011. Mikrobiológia. Bratislava: STU. 266 s. ISBN 978-80-227-3600-8.
Bednář, M. et al. 1996. Lékařská mikrobiologie. Bakteriologie, virologie, parazitologie. Marvil, s.r.o. 558 s. ISBN 978-80-2380-297-9.
Votava, M. et al. 2001. Lékařská mikrobiologie obecná. Brno: Neptun. 247 s. ISBN 80-902896-2-2.
Nikš, M. a kol. 1996. Praktické cvičenia zo všeobecnej bakteriológie. Bratislava: UK. 83 s. ISBN 978-80-223-0983-7.
Votava, M. et al. 2003. Lékařská mikrobiologie speciální. Brno: Neptun. 495 s. ISBN 80-902896-6-5.
Votava, M. et al. 2000. Lékařská mikrobiologie II. Přehled vyšetřovacích metod v lékařské mikrobiologii. 1. vyd. Brno: Masarykova univerzita, Lékařská fakulta. 309 s. ISBN 80-210-2272-8.
Wessner, D. et al. 2020. Microbiology. 3rd Edition, p. 992. ISBN 978-1-119-59249-5.

Language of Instruction: Slovak language

Other course information: ----------

Grading history

Total number of students assessed:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Marta Mydlárová Blaščáková, PhD., - lecturer, examiner, seminar leader
doc. Ing. Lenka Bobuľská, PhD., - lecturer, examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KVZCL	**Title of Course: Nutrition and human health**
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester: 13/0** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 3rd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. (a) Mid-term evaluation: Active participation in lectures and seminars, preparation of a term paper in the form of a PowerPoint with subsequent presentation. Successful completion of the midterm test with a minimum pass mark of 60%. Successful completion of the midterm evaluation is a prerequisite for the final assessment. (b) Final assessment: Successful completion of a written test - a test of the material covered in the lectures, knowledge gained through seminars and self-study. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: **Knowledge gained:** The student can: - obtain basic theoretical knowledge about nutrition and human health; - analyse and recognise the processes of metabolism, correctly define the energy balance of the body and the regulation of food intake; - is able to describe differentiated nutrition in individual developmental periods, knows all negative factors of eating disorders, individual alimentary diseases and their prevention; - knows the relationship between healthy nutrition and human health; - point out the occurrence of certain diseases such as diabetes, cardiovascular diseases and other diseases of civilisation, diseases of the digestive system due to improper lifestyle. **Skills Acquired:** The student can: - evaluate the nutritional status of an individual; - independently discuss a given issue in the field of nutrition and human health; - apply the acquired knowledge in the context of the content of other subjects; - independently prepare a seminar project on a selected topic, demonstrating the ability to work with professional literature, information media, and select relevant data;	

- is able to present a seminar project in the form of a PowerPoint presentation in the time interface and discuss the selected issue;
- is able to interpret the acquired knowledge in his/her own words;
- is able to apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context;
- think critically, formulate their own conclusions and defend them.

Acquired competences:

The student can:
- apply the acquired knowledge and skills;
- solve professional tasks;
- coordinate sub-activities and work collectively;
- take responsibility for the tasks and results of their work;
- has developed competences for further self-education;
- apply the acquired theoretical knowledge and practical skills in solving problems in the field of nutrition and human health.

Syllabus/Indicative Content:

- Digestive system (anatomical structure of the digestive system, enzymes of the digestive system), metabolism, microbiome,
- Components of food – nutrients,
- Macronutrients (proteins fats, carbohydrates),
- Micronutrients,
- Vitamins,
- Digestibles,
- Foreign substances in food - alimentary diseases,
- Principles of good nutrition,
- Eating disorders and their prevention,
- Alternative nutritional directions,
- Importance of physical activity,
- Assessment of the nutritional status of the individual,
- Nutritional peculiarities of children, adolescents and the elderly,
- Factors endangering human health.

Suggested readings:

Pavúk, A., Zigová, M., Priganc, M. (2016). Výživa a zdravie. Grafotlač Prešov s.r.o., s.106, ISBN 978-80-555-1763-6

Mačurová, Ľ., Pavúk, A. (2007). Školská hygiena a primárna prevencia drogových závislostí. Vysokoškolské skriptá FHPV PU Prešov, s. 192, ISBN 978-80-8068-655-0

Kotulán, J. (2012). Zdravotní nauky pro pedagogy. 3. vydání. Brno: Masarykova univerzita, s. 258, ISBN 9788021057630.

Marcinková, D., Rohárikova, V. (1990). Biológia a zdravotnícka prevencia. Vysokoškolské skriptá Pedagogická fakulta UMB Banská Bystrica, s.184.

Duranková, S. et al. (2018). Biology of children, adolescents and school hygiene. Wydavnictwo RHETOS, Warszawa, ISBN 978- 83-951116-1-7.

Language of Instruction: Slovak language

Other course information: Two justified absences are tolerated in the seminars.

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Ing. Hedviga Hrušovská, PhD. - lecturer, examiner, seminar leader
Last update: 30 September 2024
Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KBIOD	**Title of Course:** Biodiversity
Form of Study: lectures, seminares **Number of contact hours:** per week: 1 lectures, 1 seminares per level/semester: 10 lectures, 10 seminars, independent field work - cognition, study and documentation of biodiversity in the natural environment 10 in el. application (e.g. iNaturalist), 15 seminar work hours, 15 self study hours In three field and subsequent laboratory exercises, the student completes the collection, processing and analysis of biodiversity samples (field, laboratory). **Method**: physical presence/traditional classrooms	
Number of credits: 2	
Semester: 1. semester /2. study year	
Degree/Level: 1	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Presence at seminars is mandatory. A student can have a maximum of 1 absence justified on the basis of a medical certificate. In the absence of the student will receive substitute tasks, respectively graduates consultation. In case of unjustified absence or a large number of absences, a student will not grant credits. The evaluation of the student's study results within the study subject will be performed as follows: - continuous control of study results during the semester (seminar work) with a minimum success rate of 50%; - final exam. The success criteria (percentage expression of results) are for the classification levels as follows: a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%	
Aims and Objectives: By completing the course, the student will demonstrate knowledge of the mechanisms that create, maintaining and threatening biodiversity. Can describe global patterns of diversity on Earth, etc. environmental phenomena that lead to them. Can describe different levels of diversity (genetic, species, ecosystem). The student is acquainted with the expected trends in the evolution of biodiversity and extinctions in the Earth's past and can combine this knowledge with knowledge of the present environmental crisis and a possible six major extinctions. The student can explain the possible links between biodiversity and community stability. The student has practical skills enabling beta diversity to be used as a nature conservation tool. The student has knowledge of the basics diversity, diversity and balance indices and can apply them for comparison research groups in different localities. The student is acquainted with the concept of functional diversity and its role in community ecology.	

The student demonstrates the ability to:
- diversity sampling appropriate to each taxonomic and ecological group of organisms, in different types of habitats
- distinguish between ecological and taxonomic groups of diversity,
- knows the factors influencing diversity,
- identify (calculate) and interpret diversity at different levels and apply it for purposes nature protection.
After completing the course, students have the ability to continue their education and are able to acquire and interpret new biodiversity information. Based on them, they can solve it ecological and environmental problems related to the diversity of life and its protection creatively and make original decisions even with incomplete or limited information.
The conclusions obtained by a separate study of biodiversity issues are clear and understandable communicate and justify to people and the professional public.

Syllabus/Indicative Content:
1. Diversity of life, its origin and evolutionary past
2. Biodiversity levels, global patterns of diversity on Earth
3. Mechanisms of biodiversity formation, its evolution
4. Island biogeography, neutral biodiversity theory, applications for landscape planning.
5. Use of beta diversity in practical nature protection.
6. Indices of diversity, equilibrium, diversity, their use in community ecology.
7. Functional biodiversity and its use in practice.
8. Biodiversity and community stability
9. Reasons for endangering biodiversity in Slovakia and in the world.
10. Biodiversity protection.
11. Biodiversity and ecosystem services.

Suggested readings:
TOWNSEND, R. C., BEGON, M., HARPER, L. J.: Základy ekologie (z anglického originálu: Essential of Ecology). 1. české vyd., Univerzita Palackého Olomouc: Blackwell Publishing, 2010.
BEGON, M., TOWNSEND, R.C. Ecology. From individuals to ecosystem. 5th edition, Wiley & Sons. 2021.
WILSON, E.O. Rozmanitost života. Lidové noviny. 1995.
PRIMACK, R.B., Kindlmann, P., Jersáková, J. Biologické principy ochrany přírody; Portál, Praha. 2001.
MEADOWSOVÁ, D. Meze růstu, Argo, 1992.

Language of Instruction: slovak

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. Mgr. Peter Manko, PhD., lecturer, examiner, examining teacher, seminars
doc. Mgr. Martin Hromada, PhD., lecturer, examiner, examining teacher, seminars

Last update:13. January 2022

Approved by: doc. Ruslan Mariychuk, CSc.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMAPR3	**Title of Course:** Mathematics for natural scientists 3
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 1	
Semester: 2nd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Acquired knowledge: A graduate of this subject can: - to understand the meaning of concepts from the field of function of several variables - be able to search for primitive functions of selected functions - to understand the meaning of the application of a certain integral Acquired skills: A graduate of this subject can: - use editing algorithm procedures when solving examples - apply acquired mathematical skills in solving natural science problems Acquired competences: A graduate of this subject can: - determine the type of task and propose a solution procedure - solve natural science problems using the acquired mathematical apparatus - connect mathematical skills from different areas of natural sciences	
Syllabus/Indicative Content: Vectors, functions of several variables - Differential of a function, derivatives of higher orders, study of the course of a function using the derivative - Properties of indefinite integrals, integration by decomposition and adjustment of the integrand, integration by substitution method, per partes method, integration of rational functions, decomposition of the integrand into partial fractions, integration of irrational functions, integrating trigonometric functions, integrating transcendental functions, improper integrals -	

Applications of the definite integral - content of plane figures, volume of rotating bodies, length of a plane curve, content (shell) of a rotating surface, some physical applications of the definite integral (mass of inhomogeneous arcs, parts of a plane, static moments and centroids of arcs and planar elementary regions).

Suggested readings:

1. Brajerčík, J., Demko, M.: Matematika pre študentov prírodovedných odborov (biológia-ekológia-geografia), 1. časť. Elektronický učebný text. Prešovská univerzita v Prešove, 2018
2. Brajerčík J., Majherová M., Litecká J.: Matematika pre študentov prírodovedných odborov 2. Časť (Biológia - Ekológia - Fyzika - Geografia - Technika), Elektronický učebný text. Prešovská univerzita v Prešove, 2023
3. Míka,S.: Numerické metódy algebry, SNTL, Praha, 1985
4. Trávníček S., Calábek P., Švrček J., Matematická analýza I a II : (pro učitelské obory), Univerzita Palackého v Olomouci, 2014, ISBN 978-80-244-4117-7
5. Buša, Schrötter: Komplexné čísla

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: RNDr. Ivan Čurlík, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KSOPT	**Title of Course:** Optics seminar
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 20 hours	
Number of credits: 1	
Semester: 3rd semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: Student evaluation is based on the results of 2 written papers during and active participation in seminars. The final evaluation is given by the sum of points. - 2 written papers during the semester – 2 x 30% = 60% - active participation in seminars – 40% Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: A graduate of the course can: Acquired knowledge: - understand the meaning of mathematical formulations of physical laws and their connection with the physical phenomena they describe - be able to edit mathematical equations and convert units Acquired skills: - be able to determine the type of task and correctly choose the algorithm for solving it - arrive at a numerical solution Acquired competences: - be able to make a discussion to solve the task - connect acquired knowledge with knowledge from various areas of natural sciences - apply procedures for solving similar tasks from related fields	
Syllabus/Indicative Content: Oscillations. Linear harmonic oscillator. Stacking of oscillations. Waves, types of waves. The wave equation. Concept of photon, corpuscular wave dualism. Propagation, reflection, refraction and dispersion of light. Interaction of optical radiation with matter. Black body radiation. Geometric optics. Display equation. Two-beam and multi-beam interference. Optical grid. Radiometry and photometry.	

Suggested readings:

1. Birčák, J. a V. Benca a M. Salák, 2002: Kmity, vlny, optika v príkladoch a otázkach, PU v Prešove, Prešov 2002
2. Štrba, A.: Všeobecná fyzika 3. Optika, Alfa, Bratislava 1980

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: doc. RNDr. Mária Csatáryová, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KPARA	**Title of Course: Parasitology**
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester: 13/0** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 4st semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous assessment. Active participation in lectures and exercises is mandatory for successful completion of the course. A student may have a maximum of 2 absences excused on the basis of a medical certificate. For absences, the student will be given make-up assignments or will undergo consultations. In case of unexcused absences or a greater number of absences, the student will not be awarded credit. The final grade is the result of successful semester midterm reviews of lectures, exercises, and recommended readings. Grading criteria for the test: A: 100-90%, B: 89-80%, C: 79-70%, D: 69-60%, E: 59-50%, FX = 49.99 or less.	
Aims and Objectives: **Knowledge gained:** The student can: - has knowledge of basic terms in the field of parasitology, - has an adequate level of understanding and ability to define professional and methodological knowledge in the field of parasitology, - is familiar with the basic systematics of selected parasitic animals, - is able to discuss the epidemiological process of parasitosis, - knows medically important parasites, their development cycle and can explain their spread, - can describe the pathogenesis, clinical symptoms and course of the most important parasitosis, - has knowledge of the possibilities of their laboratory diagnosis and the possibilities of their prevention, - is able to discuss parasitic diseases, the possibilities of their occurrence and spread, as well as prevention. **Skills Acquired:** The student can: - knows how to respond to the model issue of occurrence and transmission of medically significant parasitosis, - is able to synthesize, integrate and implement acquired theoretical knowledge and knowledge about selected medically significant parasitosis into other related fields, - can actively acquire new information from the field of parasitology,	

- to create a project to prevent the emergence and spread of medically significant parasites for high school youth and the general public.

Acquired competences:

The student can use knowledge for professional and personal development mainly in the form of:

- demonstration of critical and creative thinking using knowledge about the most serious parasitic diseases and their causative agents,
- demonstrating the nature and importance of specific prevention for health promotion,

implementation of acquired knowledge and skills from the epidemiology of parasitic diseases with their subsequent synthesis and application in other professional subjects.

Syllabus/Indicative Content:

- definition of parasitology and its position in the scheme of life sciences
- parasite and parasitism
- forms of parasitism
- parasite and its host
- specificity of parasites
- pathogenity of parasites
- natural transmissible disease outbreak
- Special parasitology: Inventor biology, developmental cycle, transfer mechanisms, relations between parasites and hosts, clinical signs, diagnosis and prevention of major health parasitic zoonoses caused by:
- Protozoa
- Helminths
- Arthropods
- Parasitic plants.
- Parasitic fungi.

Suggested readings:

Koščová, L., Manko, P., Oboňa, J., 2022. Základy ekológie parazitov : vysokoškolská učebnica. 1. vyd. - Prešov : Vydavateľstvo Prešovskej univerzity, 2022. - 223 s. ISBN 978-80-555-3050-5.

Ondriska, F. a kol.: Parazitológia pre všeobecných lekárov. Bratislava: Josef Raabe Slovensko, 2015, 1. vydanie. ISBN 978-80-8140-216-6.

Bednář, M. a kol.: Lékařská a speciální mikrobiologie a parazitológie. Praha, Marvil, 1994, 226s.

Jíra, J.: Helmintológie. Praha, Galen, 1998, 495s.

Nováková, E. a kol.: Lekárska parazitológia. Vydavateľstvo: PRO, 2006, 96 s.

Totková, A. a kol.: Lekárska parazitológia. Vydavateľstvo Osveta, Martin, 2008, 400s.

Kredba, V. a kol.: Infekční a parazitární nemoci. Avicenum, Praha, 1976, 263s.

Begon N M., Harper J.L., Towsend C.R. (1997): Ekologie: jedinci, populace, společenstva. Univerzita Palackého, Olomouc

Bush A. O., Fernandez J. C., Esch G. W., Seed J. R. (2001): Parasitism: The diversity and ecology of animal parasites. Cambridge University Press, Cambridge.

Hudson P. J., Rizzoli A., Grenfell L B. T., HeesterbeekK H., Dobson P. A (Eds.) (2006): The ecology of Wildlife Diseases. Oxford University Press, Oxford.

Volf P., Horák P. (2007): Paraziti a jejich biologie. Vyd. Triton.

Language of Instruction: Slovak language

Other course information: Two justified absences are tolerated in the seminars.

Grading history
Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:
doc. MVDr. Soňa Mačeková, PhD.. - lecturer, examiner, seminar leader
doc. Ing. Jozef Oboňa, PhD. - lecturer, examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KEMVB	**Title of Course: Embryology and human developmental biology**
Type, scope and method of educational activities: Complusory Elective course **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous assessment. To successfully complete the course, active participation in lectures and seminares is required. Within the seminars, it is required to prepare a seminar project on a given topic and present it in the form of a PowerPoint presentation in the range of 10 minutes. A student may have no more than 2 absences justified by a doctor. The student will receive substitute assignments, resp. attendance consultations for missed lectures. Students will not be given credits for unjustified or multiple absences. The written exam is a result of the course evaluation in the range of lectures, seminars and recommended literature. Success criteria: A: 100.00 – 90.00%, B: 89.99 – 80.00%, C: 79.99% - 70.00%, D: 69.99 % - 60.00 %, E: 59.99 % - 50.00 %. FX: 49.99 % and less %.	
Aims and Objectives: **Knowledge gained:** Student: - can understand and appropriately apply the acquired knowledge in the field of human embryology and human developmental biology; - can use the acquired knowledge to explain and describe theoretical knowledge about the prenatal and postnatal period of human development, about the development of tissues, organs and organ systems, the laws of physical growth and development and biological age; - can analyze and recognize processes and changes in the ontogenetic development of an individual; - knows all teratogenic factors (chemical, biological and physical) that negatively affect the development of an individual in the prenatal and postnatal period, their clinical impact and knows the possibilities of prevention; - knows the changes in the development of the systems in the different developmental periods (central nervous system and cardiovascular system, lymphatic system, respiratory system, digestive system, endocrine system and urogenital system. **Skills Acquired:** Student:	

- can independently discuss issues from the field of human ontogenesis;
- can understand the complexity of phenomena and formulate decisions regarding human developmental biology;
- is able to discuss the importance of reproductive and sexual health, the importance of family planning, prenatal diagnostics, the possibility of assisted reproduction and artificial insemination techniques, and take his own position on the issue;
- is able to interpret his knowledge into pedagogical practice and develop natural science literacy in primary and secondary schools in the field of embryology and human developmental biology.

Acquired competences:

The student:

- has developed competencies for further self-education in the field of human ontogenetic development;
- can use acquired theoretical knowledge and practical skills in solving problems in the field of embryology and human developmental biology;
- can take responsibility for team results;
- can implement and synthesize acquired knowledge in practice.

Syllabus/Indicative Content:

Overview of human ontogenetic development. Overview of development in individual weeks of the prenatal period. Topographic terms in embryology, basic processes in prenatal development. Spermiogenesis and oogenesis. The female reproductive cycle. Egg fertilization, blastogenesis. Implantation of the blastocyst. Germ leaves and extraembryonic parts. Primitive organs of the embryo, formation of the body of the embryo. Structure and function of the placenta. Organogenesis and histogenesis of the fetus. Congenital developmental defects and factors negatively affecting fetal development. Prenatal diagnosis. Childbirth, signs of a full-term fetus, meaning of umbilical cord blood.

Postnatal development of the individual, characteristics of individual periods. Neonatal period - characteristics of the period. Infanthood - characteristics of the period. Toddler age - characteristics of the period. Preschool age - characteristics of the period. School age - characteristics of the period. Adolescence - characteristics of the period. Adulthood - characteristics of the period. Aging and old age - theories of aging. Regularities of physical growth and development. Acceleration and secular trend. Biological age (proportional, dental, bone).

Suggested readings:

KAPELLER, K. a V. POSPÍŠILOVÁ, 2001. Embryológia človeka: učebnica pre lekárske fakulty. Osveta. ISBN 80-8063-072-0.

KAPELLER, K. a V. POSPÍŠILOVÁ, 1996. Embryologický atlas of Embryology. Osveta. ISBN 8021705493.

PETREJČÍKOVÁ, E. a K. ŠKOVRANOVÁ, 2015. Základy embryológie človeka, Prešov. ISBN 978-80-555-1281-5.

SADLER, T.W., 2010. Langmanova lékařská embryologie. Grada. ISBN 9788024726403.

VACEK, Z. 2006. Embryologie. Grada, ISBN: 8024712679.

MOORE, K. L., PERSAUD, T. V. N. a M. G. TORCHIA, 2019. The developing human. Clinically Oriented Embryology, 11th edition. Elsevier Science. ISBN 0323611540.

POSPÍŠIL, M.F. a kol., 2002. Biológia človeka 2. Bratislava: Vydavateľstvo Univerzity Komenského v Bratislave. JSBN 80-223- 1542-7.

DURANKOVÁ, S. et al., 2018. Biology of children, adolescents and school hygiene. Wydavnictwo RHETOS, Warszawa, ISBN 978- 83-951116-1-7.

KAPELLEROVÁ. A., et al., 2002. *Propedeutika detského lekárstva*. [*Propedeutics of paediatrics*]. Bratislava: UK, ISBN 80-223-1624-5.

KONČEKOVÁ, Ľ. , 2005. *Vývinová psychológia*. [*Developmental Psychology*]. Prešov: Lana. ISBN 80-969053-6-8.

Language of Instruction: Slovak language

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. RNDr. Eva Petrejčíková, PhD. - lecturer, examiner,
PaeDr. Silvia Duranková, PhD. - examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: *University of Prešov in Prešov*	
Faculty: *Faculty of Humanities and Natural Sciences*	
Subject code: 2EKO/KTALM	**Name of subject: Field and laboratory methods**
Type, scope and method of educational activities: Compulsory elective subject **Form of Study:** seminars **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Recommended semester/trimester of study: 4th semester	
Degree of study: 1st degree (Bachelor)	
Conditional subjects: ---	
Conditions for passing the subject: Graduated. Participation in exercises is mandatory. A student can have a maximum of 1 day of absence excused based on a medical certificate. In case of absence, the student will receive substitute assignments. In case of unexcused non-participation or a large number of absences, the student will not be granted credits. The evaluation of the student's study results within the study subject will be carried out by checking the field protocols. The student receives the grade "passed" if he actively participates in all parts of the field practice and prepares and submits written reports on the work performed. Participation in seminars is mandatory. A student can have a maximum of 2 excused absences based on a medical certificate. For absences, the student will receive substitute assignments, or undergoes consultations. In case of unexcused non-participation or a large number of absences, the student will not be granted credits. The evaluation of the student's study results within the study subject will be carried out by continuous control of the study results and the completion of assigned tasks during the teaching part of the semester with a minimum success rate of 50%	
Learning outcomes: **Acquired knowledge:** Student: - acquire basic theoretical and practical knowledge about field and laboratory methods - demonstrate knowledge regarding field and laboratory methodology with an overlap into applied biological sciences and related natural science disciplines, which are relevant in relation to the study of living nature as an integrated unit of biology and ecology, - get an overview of the basic equipment of biochemical and biological laboratories, - familiarizes himself with professional terminology, which he learns to use appropriately - has the opportunity to develop manual skills in handling laboratory equipment and will learn to use basic biochemical methods for work in the laboratory - demonstrates skills, knowledge abilities related to field work in field research of plants, animals and inanimate nature **Acquired skills:** Student:	

- can continue their education and can master and use new methods for solving ecological problems at the level of basic and applied research, as well as professional practice in the field of natural sciences,
- can interpret the acquired knowledge in his own words,
- can apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context,
- can think critically, formulate own conclusions and defend them.

Acquired competences:

Student:
- can apply acquired knowledge and skills,
- can solve professional tasks,
- knows how to coordinate partial activities and work collectively,
- can take responsibility for the tasks and results of their work,
- has developed competences for further education itself,
- can use acquired theoretical knowledge and practical skills in solving future problems in the field and laboratory.

Brief outline of the subject:

Introduction to laboratory technology, safety rules, first aid principles, laboratory equipment, materials used in the laboratory. Basic laboratory operations, blenders, mixers and ultrasound. The method of using a pH meter, mechanical separation of substances, methods of extraction of natural substances, physical separation of substances, the principle and operation of more advanced analytical devices. Scientific methods. Hypothesis. Science and nature. Method selection criteria. Biological and ecological data. Sampling. Coincidence. Replications. Sample size. Determination of abundance. Determination of diversity. Sampling design and experimental design in field conditions, Obtaining data on different environments. Collection of animal and plant material. Study of flora and fauna during field trips to habitats with different ecological conditions. Determination of organisms. Methods of collection, documentation, records and storage of material. Experiments in biology and ecology, Experimental design. Possibilities of data analysis. Data interpretation. Methodological errors.

Recommended literature:

BARTAL, M. 2013. Jednoduché prístrojové metódy v školskom laboratóriu. Bratislava
STEINMETZ, W. 2012. Common laboratory techniques and practices.
WHO 2010. Good Laboratory Practices (GLP).
HEGAROVÁ, O. 2009. Základy teorie a metodologie vědy. Praha.
KOMÁREK, S. 1997. Dějiny biologického myšlení. Vesmír, Praha.
BUCHAR, J., DUCHÁČ, V., HŮRKA, K., LELLÁK, J. 1995. Klíč k určování bezobratlých. Scientia, Praha.
GAISLER, J., ROZKOŠNÝ, R. 1981: Terénní práce ze zoologie (Field course of zoology). 2. vyd. Brno : Masarykova univerzita. 317 pp.
HAUER, F.R., LAMBERTI G.A. (eds.) 2007. Methods in Stream Ecology (Second Edition). ELSEVIER
HENDERSON, P.A. 2003. Practical Methods in Ecology. Wiley-Blackwell.
DOSTÁL J., ČERVENKA M., 1991. Veľký kľúč na určovanie vyšších rastlín I. Slovenské pedagogické nakladateľstvo, Bratislava.
DOSTÁL J., ČERVENKA M., 1992. Veľký kľúč na určovanie vyšších rastlín II. Slovenské pedagogické nakladateľstvo, Bratislava.
PIŠÚT I., PECIAR V., ČERVENKA M. 1976. Kľúč na určovanie výtrusných rastlín. III. diel. Lišajníky, machorasty a papraďorasty. SPN, Bratislava.
MORAVEC J. a kol.: 1994. Fytocenologie. Academia, Praha.

Language, the knowledge of which is necessary to pass the course: slovak language

Notes: ---

Evaluation of subjects

Total number of evaluated students: the real number of evaluated students from the introduction of the subject to its last update is given

A	B	C	D	E	FX

Lecturer:

doc. RNDr. Daniela Gruľová, PhD. - examiner, seminar leader
doc. Mgr. Peter Manko, PhD. - examiner, seminar leader
doc. Ing. Jozef Fejér, PhD. - examiner, seminar leader
RNDr. Jakub Fedorčák, PhD. - examiner, seminar leader
RNDr. Adriana Eliášová, PhD. - examiner, seminar leader
RNDr. Michal Rendoš, PhD. - examiner, seminar leader

Date of last change: 30 September 2024

Proven by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: Prešov University of Prešov	
Faculty: Faculty of humanities and natural sciences	
Code: 2EKO/KBIOLI	**Title of Course: Biological invasions**
Type, scope and method of educational activities: Compulsory elective subject **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: ---	
Grading Policy (Assessment/Evaluation): Continuous assessment. Active participation in lectures and seminars is mandatory. A student can have a maximum of 1 absence justified on the basis of a medical certificate. In case of unjustified non-participation or a large number of absences, the student will not be granted credits. The evaluation of the student's study results within the study subject will take place: final test with a minimum success rate of 50%. The success criteria (percentage of results) for the classification levels are as follows: a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%	
Aims and Objectives: Learning outcomes: **Acquired knowledge:** Student: - can describe and define the concept of biological invasions, - can characterize specific invasive taxa for the territory of Slovakia and Europe, - knows how to navigate the applicable legislation, - can explain the causes and consequences of biological invasions, - can give examples of the possibilities of mitigating and eliminating the negative impacts of biological invasions at the local and global level. **Acquired skills:** Student: - can explain the term biological invasion, - acquires practical skills that enable the use of knowledge about invasive species as a tool for nature protection, - acquires knowledge about basic invasive species and can apply them to compare the studied organisms in different locations., - is familiar with the legislation and management of invasive species,	

- can interpret the acquired knowledge in his own words,
- can apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context,
- can think critically, formulate own conclusions and defend them.

Acquired competences:

Student:
- can apply acquired knowledge and skills,
- can solve professional tasks,
- knows how to coordinate partial activities and work collectively,
- can take responsibility for the tasks and results of their work,
- has developed competencies for further self-education,
- can use acquired theoretical knowledge and practical skills in solving problems in the field of biodiversity and the spread of invasive species.

Syllabus/Indicative Content:

1. Definition of the term invasion.
2. Invasive plant species for the territory of Slovakia - distribution, characteristics
3. Current research of plant invasions
4. Changes in invertebrate and vertebrate communities as a result of plant invasions
5. Ecological, economic and health consequences of plant invasions
6. Methods of management of invasive plant species
7. Invasive animal species for the territory of Slovakia - distribution, characteristics
8. Current research of animal invasions
9. Changes in communities due to animal invasions
10. Ecological, economic and health consequences of animal invasions
11. Methods of management of invasive animal species
12. Invasive species legislation in the EU
13. Legislation of invasive species in the Slovak Republic

Suggested readings:

Gojdičová, E., Cvachová, A., Karasová, E., 2002: Zoznam nepôvodných, inváznych a expanzívnych cievnatých rastlín Slovenska 2. Ochrana prírody, Banská Bystrica, 21: 59 – 79.
Medvecká, J., Kliment, J., Májeková, J., Halada, Ľ., Zaliberová, M., Gojdičová, E., Feráková, V., Jarolímek, I., 2012: Inventory of the alien flora of Slovakia. Preľad nepôvodnej flóry Slovenska. Preslia 84: 257–309.
https://fns.uniba.sk/fileadmin/prif/geog/kfg/O_katedre/Publik_fulltexty/RuzekNoga2015_InvazneDruhyRastlinVStrednejEurope.pdf68
Usmernenie na odstraňovanie inváznych druhov rastlín

Language of Instruction: slovak language

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:

doc. RNDr. Daniela Gruľová, PhD. - examiner, lecturer
doc. Mgr. Peter Manko, PhD. - examiner, lecturer
RNDr. Jakub Fedorčák, PhD. - examiner, lecturer
doc. Ing. Jozef Oboňa, PhD. - examiner, lecturer
doc. Ing. Lenka Bobuľská, PhD. - examiner, lecturer
RNDr. Beáta Baranová, PhD. - examiner, lecturer

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/VSANORG	**Title of Course:** Seminar in Inorganic Chemistry
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** seminar **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 2.	
Degree/Level: 1.	
Prerequisities:	
Grading Policy (Assessment/Evaluation): **Grading Policy (Assessment/Evaluation):** Compulsory participation. The examiner assesses if, and in that case how, absence can be compensated. Written report and oral presentation on a specific topic, which will be assigned at the beginning of the course. (40 %). Final written test (60 %). Success criteria (percentage): A: 100 - 90 %; B: 89 - 80 %; C: 79 - 70 %; D: 69 - 60 %; E: 59 - 50 %; FX: 0 - 49 %. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - acquires supplementary education for the subject of inorganic chemistry, for a better understanding of the subject; - get acquainted with current topics of primary and applied research in the field of inorganic chemistry. Acquired skills: Student: - learn to solve practical problems in the field of inorganic chemistry. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	

Syllabus/Indicative Content:
Topics according to the syllabus of the Inorganic Chemistry lectures. Additional topics of current research in the field of inorganic chemistry (magnetochemistry, bioinorganic chemistry, material chemistry, medicinal chemistry, environmental chemistry, catalysis).

Suggested readings:
P. Atklins. Shriver and Atkins' Inorganic Chemistry, 5th ed., Oxford University Press, 2010, ISBN: 978-0199236176.
C. E. Housecroft. Inorganic Chemistry, 5th ed., Pearson, 2018, ISBN: 978-1292134147.
M. Weller. Inorganic Chemistry. 7th ed., Oxford University Press, 2018, ISBN: 978-0198768128.
Actual books and scientific publications related to the topic.

Language of Instruction: Slovak in combination with English

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - seminars
RNDr. Romana Smolková, PhD. - seminars

Last update: 14. October 2024

Approved: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/VSORGCH	**Title of Course:** Seminar in Organic Chemistry
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** seminar **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 3.	
Degree/Level: 1.	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Compulsory participation. The examiner assesses if, and in that case how, absence can be compensated. Written report and oral presentation on a specific topic, which will be assigned at the beginning of the course. (40 %). Final written test (60 %). Success criteria (percentage): A: 100 - 90 %; B: 89 - 80 %; C: 79 - 70 %; D: 69 - 60 %; E: 59 - 50 %; FX: 0 - 49 %. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - acquires additional education in the subject of organic chemistry, for a better understanding of the subject; - get acquainted with current topics of primary and applied research in the field of organic chemistry. Acquired skills: Student: - learn to solve practical problems in the field of organic chemistry. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content:	

Topics according to the syllabus of the Organic Chemistry lectures. Additional topics of current research in the field of organic chemistry (catalysis, sensors, green chemistry, functional materials, synthetic methods).

Suggested readings:

P. Vogel, K. N. Houk. Organic Chemistry: Theory, Reactivity and Mechanisms in Modern Synthesis. Wiley-VCH, 2019. ISBN: 978-3527345328.
D. R. Klein. Organic Chemistry, 4th ed., Wiley, 2021. ISBN: 978-1119761105.
J. Clayden, N. Greeves, S. Warren. Organic Chemistry, 2nd ed., Oxford University Press, 2012. ISBN: 978-0199270293.
Actual books and scientific publications related to the topic.

Language of Instruction: Slovak in combination with English

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

Doc. Ruslan Mariychuk, PhD. - seminars
RNDr. Romana Smolková, PhD. - seminars

Last update: 14. October 2024

Approved: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: *University of Presov*	
Faculty: *Faculty of Humanities and Natural Sciences*	
Code: 2EKO/VSANALYT	**Title of Course:** Seminar in Analytical Chemistry
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** seminar **Number of contact hours:** 2 **per week:** 2 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: *2*	
Semester: *4.*	
Degree/Level: *1.*	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Compulsory participation. The examiner assesses if, and in that case how, absence can be compensated. Written report and oral presentation on a specific topic, which will be assigned at the beginning of the course. (40 %). Final written test (60 %). Success criteria (percentage): A: 100 - 90 %; B: 89 - 80 %; C: 79 - 70 %; D: 69 - 60 %; E: 59 - 50 %; FX: 0 - 49 %. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - obtains additional education for the subject of analytical chemistry, for a better understanding of the subject; - get acquainted with current topics of primary and applied research in the field of analytical chemistry. Acquired skills: Student: - learn to solve practical problems in the field of analytical chemistry. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content:	

Topics according to the syllabus of the Analytical Chemistry lectures. Additional topics of current research in the field of organic chemistry (forensic science, bioanalysis, clinical research, environmental analysis, material analysis).

Suggested readings:

D. Skoor, D. West, F. Holler, S. Crouch. Fundamentals of Analytical Chemistry, 10th ed., Cengage Learning, 2021. ISBN: 978-0357450390.

G. D. Christian, P. K. Dasgupta, K. A. Schug. Analytical Chemistry, 7th ed., 2013. ISBN: 978-0470887578.

Actual books and scientific publications related to the topic.

Language of Instruction: Slovak in combination with English

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - seminars

RNDr. Romana Smolková, PhD. – seminars

Last update: 14. October 2024

Approved: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/POKRMAT	**Title of Course:** Advanced materials
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 2., 4.	
Degree/Level: 1.	
Prerequisites:	
Grading Policy (Assessment/Evaluation): Continuous evaluation on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - get an overview of new developments in the field of advanced materials and material technologies; - they will be able to discuss these developments for the classes of materials you will encounter in the course. Acquired skills: Student: - critically evaluate the prospects and threats of modern development of materials; - develop a research strategy for the development of innovative materials and their applications and a feasible path for its development. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally;	

- can work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:

An introduction to the development and applications of modern materials and innovative material concepts such as, but not limited to, nanomaterials, nanocomposites, materials for solar cells and adsorbents. Nanomaterials. Definition, history, preparation. Metal nanoparticles. Synthesis, properties and application. Carbon nanoparticles. Synthesis, properties and application. Advanced adsorbents. Classification, preparation, properties and use. Nanocomposites. Classification, preparation, properties and use. Materials for solar cells.

Suggested readings:

1. Diyuk V., Lisnyak V.V., Mariychuk R. Advanced carbon materials for environmental technologies. Prešovská univerzita v Prešove, Prešov., 2021, ISBN: 978-80-555-2774-1, 138 s.
2. A. Tiwari, M. Syväjärvi. Advanced Materials for Agriculture, Food, and Environmental Safety. Scrivener Publishing, USA, 510p., ISBN 978-1-118-77343-7
3. Research papers.

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

Doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. – lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/TOXICOL	**Title of Course:** Toxicology
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 2., 4.	
Degree/Level: 1.	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Continuous evaluation on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - have an overview of studies on the side and toxic effects of various types of substances on the human body, animals, plants and the environment; - know about the basic types of toxic substances and their effect. Acquired skills: Student: - have an overview of the risks when working with chemical substances, their classification and legislation related to their safe use; - will be able to identify types of toxic substances based on a standard package of chemical reagents. Acquired competences: Student: - the student acquires communicative competences, can explain used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally;	

- can work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:

Introduction to toxicology. A brief history of toxicology. Basic concepts and terminology. General effects of chemical compounds. Classification of toxic substances. Exposure and effect of toxic substances. Absorption, distribution, metabolism and excretion of toxic substances. Diagnosis of poisoning and therapy. Toxicity testing. Toxicological legislation. Toxic effects of selected industrial substances: inorganic, organic and radioactive compounds. Toxicology of drugs. Military toxicology. Food toxicology. Toxicology of natural substances. Ecotoxicology.

Suggested readings:

E. Hodgson. A Textbook of Modern Toxicology. 4th ed., John Wiley & Sons, Inc., 2010. ISBN 978-0-470-46206-5.

P.K. Gupta. Fundamentals of Toxicology: Essential Concepts and Applications., Elsevier, 2016. ISBN 978-0-12-805426-0.

J. A. Timbrell: Introduction to Toxicology, 3rd ed., CRC Press, 2001. ISBN 978-0415247627.

J.H. Duffus, H.G.J. Worth. Fundamental toxicology, 2nd ed., RSC Publishing, 2006. ISBN 978-0854046140.

J. Prokeš et al.. Základy toxikologie. Obecná toxikologie a ekotoxikologie. Galén, 2005. ISBN 80-7262-301-X.

J. Horák, I. Linhart, P. Klusoň. Úvod do toxikologie a ekologie pro chemiky, VŠCHT, 2004. ISBN 978-80-7080-548-0.

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/PRIRZLUC	**Title of Course:** Natural compounds
Type, scope and method of educational activities: Obligatory elective subject **Form of Study:** Lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 3., 5.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - have an overview of the chemical and biological properties of the main groups of natural compounds; - know the connection between chemical structure and biological properties. Acquired skills: Student: - have an overview of typical biosynthetic pathways and examples of total syntheses; - have an overview of the practical use of selected natural compounds in connection with their chemical properties. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.;	

- acquires professional competences within his field.

Syllabus/Indicative Content:
Introduction. Sugars. Monosaccharides, oligosaccharides and polysaccharides. Amino acids, peptides and proteins. Nucleosides, nucleotides and nucleic acids. Polyketides. Fatty acids and their derivatives. Polypropionates – polyether antibiotics, macrolides and spiroketals. Terpenes: Terpenes, carotenoids, steroids. Essential oil. Polyphenols: flavonoids and anthocyanins. Other types of natural compounds.

Suggested readings:
1. Koskinen, A. M. P. Asymmetric Synthesis of Natural Products; Wiley: Chichester, 2012.
2. Lindhorst, T. K. Essentials of Carbohydrate Chemistry and Biochemistry; Wiley-VCH: Weinheim, 2007.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
Doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KIKTFY	**Title of Course:** ICT in Physics
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 20 hours	
Number of credits: 1	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. During the semester student • actively participates in the seminar, where independently elaborates sample assignments on a computer under the guidance of the teacher (50%) • submits elaborated self-proposed tasks (50%) Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: **Knowledge:** - mastering basic or advanced hardware control (measuring systems, sensors in mobile devices) - mastering the basic or advanced control of the software used **Skills:** - Implement selected experiments using digital measuring systems or mobile devices - Use more advanced features of the programs used - Be able to perform the procedure for export, or data conversion - Be able to process the measured data using the appropriate programs - Perform basic formatting of processing outputs **Competences:** - Correctly interpret the results of data processing	
Syllabus/Indicative Content: Computer-aided physics experiment. Experiment using mobile devices. Remote experiment. Experiment simulation. Data processing using appropriate programs MS Excel, GeoGebra, Origin, Google Sketchup, GnuPlot: sorting, 2D and 3D graphs, investigation of the monotony of functions, curve fitting, data filtering, and data conversion.	
Suggested readings: 1. Koubek V. a kol: Školské pokusy z fyziky. 1992. SPN Bratislava 2. Online a offline manuály špecializovaných programov. 3. Burgerová J., Burger V.: Systémové a aplikačné programy pre personálne počítače. FHPV Prešov 2002	
Language of Instruction: Slovak language	

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: doc. RNDr. Sergej Iľkovič, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KZPRA3	**Title of Course:** Basic physical laboratory exercise 3
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Laboratory **e**xcercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 10 hours Protocols preparation: 10 hours	
Number of credits: 1	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Acquired knowledge: - Correctly carry out physical measurement in terms of direct or relative measurement - Assess the correctness of the measurement - Determine the error and uncertainties in the measurement of physical quantities, as well as the relationship between them - Verify the correctness of the physical law that governs the given phenomenon Acquired skills: - Define basic concepts from the optical field of electromagnetic waves and understand the basic laws governing these phenomena - To understand the relationships of these phenomena and laws to each other as well as their links to technical and technological disciplines and technical systems (or devices, machines and tools) used in everyday life by the majority of humanity today - Process experimental results using individual measurement methods - Evaluate the measurement results Acquired competences: - the ability to convey scientific foundations through the application of modern progressive methods; - ability to plan one's activity; - the ability to reflect, evaluate and modify one's own educational activity.	
Syllabus/Indicative Content: At the beginning of the semester, students are familiarized with the organization of the subject teaching and the principles of work safety in the laboratory, and then perform	

laboratory exercises from the list according to the schedule that is determined in the introduction.

Experimental tasks from optics:
The study of refraction of light. Geometric optics. Display equation. Optical grid. A study of the refractive index of liquids. Dispersive prism. Twisting the plane of polarization - polarimeter. Fundamentals of spectroscopy.

Suggested readings:

1. Turán, J.: Optoelektronika, Košice TU 1991
2. Watson, J.: Optoelektronics, Wolkingham Van Nostrand 1988
3. Štrba, A.: Všeobecná fyzika 3 Optika, Alfa, Bratislava 1980
4. Krempaský, J.: Fyzika, Alfa, Bratislava 1983
5. Birčák, J., Benca, V., Salák, M.: Kmity, vlny, optika v príkladoch a otázkach, Preš. univ. v Prešove
6. Internet sources

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: doc. RNDr. Mária Csatáryová, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMAPR4	**Title of Course:** Mathematics for natural scientists 4
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 10 hours Guided work - tasks: 10 hours	
Number of credits: 1	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: Two written examinations during the semester. In order to successfully complete the subject, it is necessary to obtain at least 50% points. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Acquired knowledge: - to understand the reasons and ways of developing functions to infinite orders - to learn methods of developing functions to some infinite orders - learn to distinguish different types of differential equations Acquired skills: A graduate of this subject can: - use function development algorithms to some infinite orders - apply acquired mathematical skills in solving natural science problems Acquired competences: A graduate of this subject can: - determine the type of task and propose a solution procedure - solve natural science problems using the acquired mathematical apparatus - connect mathematical skills from different areas of natural sciences	
Syllabus/Indicative Content: Taylor series, Fourier series - Partial derivatives, total differential - Differential equations of the 1st order. - Differential equations of the 2nd order.	
Suggested readings: 1. Brajerčík, J., Demko, M.: Matematika pre študentov prírodovedných odborov (biológia-ekológia-geografia), 1. časť. Elektronický učebný text. Prešovská univerzita v Prešove, 2018	

2. Brajerčík J., Majherová M., Litecká J.: Matematika pre študentov prírodovedných odborov 2. Časť (Biológia - Ekológia - Fyzika - Geografia - Technika), Elektronický učebný text. Prešovská univerzita v Prešove, 2023
3. M.Barnovska a kol.: Matematicka analyza III, elektronické skriptá FMFI UK
4. Míka, S.- Kufner, A.: Parciální diferenciální rovnice, SNTL Praha, 1983.
5. Rostás K.: Obyčajné diferenciálne rovnice, online skriptá, Fakulta matematiky, fyziky a informatiky Univerzity Komenského v Bratislave

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No. 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KBDDOD	**Title of Course: Biology of Children and Adolescents, School Hygiene, Drug Addictions**
Type, scope and method of educational activities: Compulsory elective courses **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student load: 60 hours** **Direct study:** 10 hours **Self-study:** 40 hours **Guided work:** 10 hours **Method of study:** combined	
Number of credits: 2	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. The student will write 2 tests - one in the middle of the semester and the other at the end of the semester. A final grade will be given from the scores of both tests. Criteria: A: 100,00 – 90,00 %; B: 89,99 – 80,00 %; C: 79,99 – 70,00 %; D: 69,99 – 60,00 %; E: 59,99 – 50,00 %; FX: 49,99 and less %.	
Aims and Objectives: Knowledge: Graduate of the course: - Can define the basic concepts of child and adolescent biology and school hygiene; - can characterize the main stages of ontogenetic development; - can describe the effects of different hormones on the growth and development of children and adolescents; - can classify congenital developmental defects; - can classify the hygiene criteria for school interiors and the principles of hygiene of the pedagogical process. Skills: The graduate of the course: - Can discuss the prevention of drug addiction; - can think critically, formulate his/her own conclusions and defend them. Competences: The graduate of the course will: - can apply the acquired knowledge in an interdisciplinary context.	
Syllabus/Indicative Content: Growth and development of the individual. The laws of growth and development. Regulation of growth and development. Ontogenetic development of the individual - neonatal period, infant period, toddler period, pre-school age, school age, adolescence. Age specific features of	

organ systems. The most common disorders and diseases in childhood. Hygiene of the school environment. Hygiene of the pedagogical process. Primary prevention of drug addictions.

Suggested readings:

Pospíšil, M. F. a kol. (2002) Biológia človeka 1. Bratislava: Univerzita Komenského. ISBN 80-223-1579- 6.

Matejovičová, B. a kol. (2007) Biológia detí a školská hygiena. Nitra: FPV UKF. ISBN 978-80-8094-113-0.

Language of Instruction: Slovak language

Other course information: -

Grading history:

A	B	C	D	E	FX

Lecturer/Instructor:

doc, RNDr. Dana Dojčáková, PhD., - lecturer, examiner
RNDr. Jana Gaľová, PhD., - lecturer, examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KINFCO	**Title of Course: Infectious and civilisation diseases**
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** seminars **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 5st semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. The course is completed with a final assessment. During the semester, on the basis of the teacher's instructions, the student will prepare a seminar paper according to the assigned topic in the range of 15 pages (introduction, core, conclusion, list of bibliographic references), present it through a PowerPoint presentation and hand it in printed form. The assessment of the seminar paper will represent 40% of the course grade. During the semester, the student will complete one continuous assessment of his/her knowledge in the form of a written test. Grades A: 100 – 90%, B: 89 – 80%, C: 79 – 70%, D: 69 – 60%, E: 59 – 50%. The final grade is the average of the marks on the mid-term test, the seminar paper and the activity during the seminars in relation to engaging in discussion on the topics presented. Attendance at the seminars is compulsory. A student may have up to 2 absences excused on the basis of a medical certificate. For absences, the student will be given make-up assignments or attend a tutorial. In case of unexcused absences or a greater number of absences, the student will not be awarded credit.	
Aims and Objectives: **Knowledge gained:** The student can: - can understand and appropriately apply the acquired knowledge in the field of civilization and infectious diseases; - can define and explain the concept of civilization and infectious diseases, characterize the causes of civilization and infectious diseases - improper lifestyle, degraded environment, lack of health awareness of the population, high number of risky workplaces; - can demonstrate an expanding knowledge and understanding of the importance of food intake, its mechanism of action, its relevance to human health; - can demonstrate the factors influencing the development of civilization and infectious diseases - stress, genetic predisposition, diet, lifestyle, smoking, alcohol, etc; - can characterize the influences - physical, chemical, biological, metagenic, psychological - that have a negative impact on human health;	

- has the ability to explain the relationships between the factors causing the prevalence of civilization diseases and infectious diseases;
- understands the positive and negative effects of the environment and the working environment on the human body;
- can define and explain important concepts in the field of civilization and infectious diseases, e.g. health, disease, etc.,
- knows the processes that negatively influence the emergence and development of individual diseases, forms of prevention of civilization and infectious diseases.

Skills Acquired:

The student can:
- can independently prepare a seminar paper on a selected civilization and infectious diseases, prepare a PowerPoint presentation, present the seminar paper in class and discuss the issue;
- can apply the acquired knowledge in the implementation of practical tasks;
- can use and apply the acquired knowledge in the context of the content of other subjects;
- can apply knowledge of the anatomy and physiology of the human body in caring for their own health and the health of others;
- can understand the interrelationships within a given subject of study;
- has developed independent learning skills that allow him/her to continue further self-study;
- the acquired knowledge, skills and abilities enable the student to pursue further studies and also to apply them in practice.

Acquired competences:

The student can:
- knows the causes and possibilities of prevention of the most common civilization and infectious diseases;
- has the ability to search for relevant professional information on civilization and infectious diseases in professional literature and information media;
- can work with relevant information;
- can develop reading literacy in a specialist biological text;
- has the ability to prepare own PowerPoint presentation and present it,
- can discuss, argue and defend their own position;
- can creatively bring new solutions to solved problems.

Syllabus/Indicative Content:

Civilization and its negative impact on the origin, development and prevalence of diseases of civilization.

Civilization diseases - causes, nature of civilization diseases.

Overview of the most common diseases of civilization: cardiovascular diseases, cancer, allergies, obesity, osteoporosis, diebetes mellitus type I and II, metabolic diseases etc.

Prevalence of civilisation diseases by sex and age.

The most common external factors influencing the occurrence of civilisation diseases: nutrition, smoking tobacco cigarettes, drinking alcoholic beverages, insufficient physical activity.

Long-term implementation of a network of integrated multi-sectoral health promotion and primary prevention activities.

General epidemiology. Basic concepts and processes. The process of spreading the infection and the degree of intensity. Characteristics, basic features, peculiarities, etiology, epidemiology, pathogenesis, clinical signs, diagnostics, anti-epidemic measures of the most important bacterial and viral intestinal infections, respiratory infections, blood infections, infections of the skin and superficial mucous membranes. Nosocomial infections.

Suggested readings:

SUCHARDA, P. a L. ZLATOHLÁVEK, 2015. Základy klinické medicíny. Praha: Karolinum. ISBN978-80-246-3091-5.
PAVÚK, A. 2007. Fajčenie žien a prenatálny vývin ich detí s osobitným zreteľom na rómsku populáciu. 173 s. Prešov: FHPV PU v Prešove. ISBN 978-80-8068-586-7.
OKRUHLICA, Ľ., a kol. 1998. Ako sa prakticky orientovať v závislostiach. Bratislava: Centrum pre liečbu drogových závislostí. 274 s. ISBN80-968111-1-8.
CLATICI, V. G. et al. 2018. Diseases of Civilization – Cancer, Diabetes, Obesity and Acne - the Implication of Milk, IGF-1 and mTORC1. In: Maedica (Bucur), vol. 13, no. 4, p. 273 – 281, ISSN 2069-6116.
MELLOVÁ, Y. a kol. 2010. Anatómia človeka pre nelekárske študijné programy. Martin: Osveta. 183 s. ISBN 978-80-8063-335-6
POSPÍŠIL, M. F. 2002. Biológia človeka 1. Bratislava: Univerzita Komenského. 285 s. ISBN 80-223-1579-6.
PARKER, S. 2008. Ľudské telo. Bratislava: Ikar, a. s. 256 s. ISBN 978-80-551-1731-7.
MAČEKOVÁ, S., GABRIKOVÁ, D.: Vybrané kapitoly z epidemiológie infekčných chorôb, I. časť: Bakteriálne ochorenia, Prešovská univerzita v Prešove, FHPV, 2015, 165 s., ISBN 978-80-555-1344-7
MACELA, A. a kol.: Infekční choroby a intracelulární parazitismus bakterií. Grada, Praha, 2006, 215s.
ADAMKOVIČOVÁ, E. a kol.: Cestovná medicína v praxi. Josef Raabe Slovensko, Bratislava, 2008.

Language of Instruction: Slovak language

Other course information: Two justified absences are tolerated in the seminars.

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor:

doc. MVDr. Soňa Mačeková, PhD.. - examiner, seminar leader
doc. RNDr. Marta Mydlárová Blaščáková, PhD. - examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: *University of Prešov in Prešov*	
Faculty: *Faculty of Humanities and Natural Sciences*	
Subject code: 2EKO/KGPOH	**Name of subject: Global problems with an emphasis on waste problematic**
Type, scope and method of educational activities: Compulsory elective subject **Form of Study:** lecture **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 40 hours Guided work: 10 hours	
Number of credits: 2	
Recommended semester/trimester of study: 5th semester	
Degree of study: 1st degree (Bachelor)	
Conditional subjects: ---	
Conditions for passing the subject: Continuous evaluation. Active participation in lectures. Final test. Grading: 91-100% points are required to get an A rating, 81-90% points to get a B rating, 71-80% points for a C rating, 61-70% points for a D rating and 51-60% points for an E rating points. 50% points and less = FX.	
Learning outcomes: **Acquired knowledge:** Student: - acquire basic theoretical knowledge about environmental problems and waste management, - can describe and define environmental problems on a local and global scale, - is able to describe and explain the causes and consequences of global problems, - can describe the global patterns of diversity on Earth and the ecological phenomena that lead to them, - can give examples of the possibilities of their solution at the local and global level, - is able to orient himself in the issue of waste in relation to enviroment, - knows the methods of dealing with different types of waste, especially at the local level. **Acquired skills:** Student: - can explain and define environmental problems on a local and global scale, - will acquire practical skills enabling the use of this knowledge in nature protection, - can interpret the acquired knowledge in his own words, - can apply the acquired knowledge in the implementation of practical tasks in an interdisciplinary context, - can think critically, formulate own conclusions and defend them. **Acquired competences:** Student: - can apply acquired knowledge and skills, - can solve professional tasks, - knows how to coordinate partial activities and work collectively, - can take responsibility for the tasks and results of their work, - has developed competencies for further self-education,	

- can use acquired theoretical knowledge and practical skills in solving problems in the field of biological sciences.

Brief outline of the subject:

1. World population and environment. Population explosion and overpopulation of the Earth.
2. Agriculture and its impact on the environment, the question of securing human nutrition, GMOs.
3. Exploitation of seas and oceans.
4. Polluting substances in the environment.
5. Loss of habitats and biodiversity, extinction of species, biological invasions.
6. Degradation of forest ecosystems, deforestation.
7. Climate changes. Greenhouse effect. Depletion of the ozone layer.
8. History of waste and current state - waste as an environmental problem.
9. Hierarchy of waste management. Prevention of waste.
10. Separate waste collection.
11. Energy and material recovery of waste, composting.
12. Waste disposal, records of waste production, RISO, POH.

Recommended literature:

BERTRAND, Y.A.: Earth beautiful and unknown. Slovart, 2001.
LOMBORG, B.: Skeptic ecologist. Dokořán, 2006.
DIAMOND, J.: Collapse. Academy, 2008.
RIDLEY, M.: A rational optimist. Dokořán, 2013.

Language, the knowledge of which is necessary to pass the course: slovak language

Notes: ---

Evaluation of subjects

Total number of evaluated students: the real number of evaluated students from the introduction of the subject to its last update is given

A	B	C	D	E	FX

Lecturer:

RNDr. Beáta Baranová, PhD. – lecturer, examiner

Date of last change: 30 September 2024

Proven by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KENIKA	**Title of Course:** Electronics
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 10 hours Guided work – feedback letters: 10 hours	
Number of credits: 1	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: Percentage distribution of assessment: - Entrance test 10% - Feedback letters 20% - Intermediate tests 30% - Active participation in lectures 10% - Exit test 30% Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Learning outcomes: The graduate of the subject will gain knowledge and acquire skills and competences: General knowledge: - describe and explain basic concepts from electronics occurring in everyday life; - to get an idea of the principles of electronic devices that are used both in physics education and in scientific research in the field of physics; Professional knowledge: - the graduate of the subject can define and interpret in his own words the basic concepts from the field of electronics; - the graduate of the course can orient himself in the phenomena and laws governing electronics; - the graduate of the subject can characterize the basic trends of modernization of teaching, in which elements of electronics are used; Cognitive skills: - a graduate of the course can propose solutions to methodological, professional and practical problems; - the graduate of the course can adapt and apply professional knowledge in the field of electronics education when innovating the teacher's pedagogical activities;	

Practical skills:
- a graduate of the course can develop examples of the application of innovative methods in the teaching of electronics;
- a graduate of the subject can implement solutions to some tasks and problems using electronic devices;
- the graduate of the subject can use the phenomena and laws applicable in electronics in professional and everyday life;

Competencies:
A graduate of the course is characterized by:
- independence in the application of electronic elements in the teaching process;
- the ability to follow modern trends in the field of electronics;
- the ability to present and discuss various professional topics in the field of electronics.

Syllabus/Indicative Content:
1. Continuous and discrete signal.
2. Passive components: resistor, capacitor, coil.
3. Physical bases of semiconductors, diodes, transistors and integrated circuits.
4. Principle of amplification, amplifiers.
5. Modulation and demodulation. Analog AM and FM modulation, digital PCM modulation.
6. The principle of radio signal transmission. Radio receiver and transmitter. HiFi.
7. Acoustic transducers: microphone (acoustic-electric), loudspeaker (electro-acoustic).
8. Basics of optoelectronics, LEDs, lasers, optical data transmission.
9. Digital television broadcasting (DVB-T, DVB-S, DVB-C).
10. Image converters: CCD, CMOS (optical-electric) and displays (electro-optical).
11. Sound and image recording means. CD, digital camera, camcorder.
12. Mobile phone - principle.
13. GPS navigation system - principle.

Suggested readings:

1. Frisch, H.: Základy elektroniky a elektronických obvodov, SNTL Praha 1987.
2. Limann, O.: Elektronika bez balastu. Bratislava : Alfa,1990.
3. Kulvanec, D.: Elektronika a výpočtová technika . Nitra : PdF, 1991.
4. Vlček, J.: Kurz základů elektroniky. Praha : BEN-technická literatúra, 2000.
5. Vlček, J.: Měření elektrických veličin. Praha : BEN-technická literatura, 2000
6. HyperPhysics - http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html

Language of Instruction: Slovak language

Other course information:

Grading history
Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: RNDr. Jozef Kmec, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KZPRA4	**Title of Course:** Basic physical laboratory exercise 4
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Laboratory **e**xcercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 10 hours Protocols preparation: 10 hours	
Number of credits: 1	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. The assessment will consist of the following parts: During the semester, the student - theoretically prepares for the experiment before the implementation of the experiment (25%) - completes all prescribed tasks (25%) - continuously submits processed protocols from measured tasks (50%) Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: **Knowledge:** - Mastering the basic principles of measurement and the theoretical basis of physical phenomena that make up the content of the subject - Mastering the basic methods of processing measured values **Skills:** - Control of selected measuring devices and measuring equipment with an emphasis on safety - Orientation in the drawing or wiring diagram and based on them to build a measuring assembly or connect the circuit **Competencies:** A graduate of the subject will be able to: - Connect theoretical knowledge with practical and apply the acquired theoretical knowledge in the implementation of experiments - Carry out a physical experiment independently and record the measured values - Ability to recognize the main risks of radiation - Be able to assess the effects of radioactive transformation processes on the environment - Understand the process of interaction of ionizing radiation with biological tissues.	
Syllabus/Indicative Content: 1. Observation of alpha particle tracks. 2. Geiger - Müller's computer. Working with an oscilloscope.	

3. Cosmic radiation and determining the lifetime of muons (theory). Measurement of the natural radiation background (real and remote experiment).
4. Determining the half-life of a radioisotope from the reduction of its activity (simulation).
5. Basics of dosimetry and protection against nuclear radiation (distance experiment).
6. Dependence of radioactivity on the distance from the emitter (distance experiment)

Suggested readings:

1. Kostiu J. E., Parlag, O. M., Pilipčenko, V. A., Udod, V. A. - preklad a úprava Iľkovič, S.: Metodické pokyny k laboratórnym prácam fyzikálneho praktika z fyziky atómového jadra a elementárnych častíc. (internal document)

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KSJADF	**Title of Course:** Atomic and Nuclear Physics Seminar
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Laboratory **e**xcercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 20 hours	
Number of credits: 1	
Semester: 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: The assessment will consist of the following parts: During the semester, the student - actively participates in solving tasks (50%) - passes written examinations consisting of solving tasks solved at the seminar (50%) Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: **Knowledge**: - Get an overview of the designation of quantities and symbols in the field of atomic and nuclear physics - To understand the basic relationships between quantities in the field of atomic and nuclear physics - Master the basic methods of solving problems in the field of atomic and nuclear physics **Skills:** - To propose an effective procedure for solving the task - Solve qualitative and quantitative tasks from atomic and nuclear physics independently - Correctly convert the units of quantities that are necessary to calculate the result - Round the results correctly - Work with a scientific calculator, or with an application on a mobile phone and on a PC (especially in connection with working with very small/large numbers) **Competencies:** - Correctly interpret the results of solving tasks - Be able to discuss the solutions to the task, or discuss tasks with changed assignments - The ability to eruditely estimate the results of some tasks even before solving them - The ability to find the application of solved tasks in practice	
Syllabus/Indicative Content: Solving examples from atomic physics: Thomson model of the atom, Rutherford's model of the atom and scattering of α particles by matter, Bohr's model of the atom, Sommerfeld's model.	

Solving examples from nuclear physics: the law of radioactive transformation, investigation of radioactive transformation α, β, γ, dosimetric calculations, calculation of mass defect, binding energy, and the energy yield of fusion and fission reactions.

Suggested readings:

1. Vrláková J., Kravčáková A., Vokál S.: Zbierka príkladov z atómovej a jadrovej fyziky, UPJŠ Košice 2016 (vysokoškolská učebnica)
2. Úlehla, I. a kol.: Atomy, jádra, částice, Academia Praha 1990
3. Šterba F. a kol.: Atómová a jaderná fyzika, SPN, Praha, 1980
4. Beiser A.: Úvod do moderní fyziky, Academia, Praha, 1975
5. Oravec J.: Atómová a jadrová fyzika, UK, Bratislava, 1979
6. Савельев И. В. - Курс общей физики том 3 (Атомная физика, физика атомного ядра и элементарных частиц)
7. Иродов И. Е - Задачи по общей физике
8. Vanovič J.: Všeobecná fyzika IV. –Atómová fyzika, Alfa, Bratislava a SNTL, Praha, 1980
9. Síleš E., Martinská G.: Všeobecná fyzika IV., časť I. a II., UPJŠ Košice (skriptá)

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Doc. RNDr. Sergej Iľkovič, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KSPEC2	**Title of Course:** Special Practicum of Physics 2
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 20 hours Protocol elaboration: 30 hours	
Number of credits: 2	
Semester: 6th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: The subject is completed with an assessment. 8 measurements carried out during the semester 60% 8 prepared laboratory protocols 40% Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: General knowledge: - understand safety regulations and health protection when working in a physical laboratory. - name and describe basic physical experiments; Professional knowledge: - can explain the physical essence of the observed event in his own words - to understand the basic laws governing phenomena. Cognitive skills: - choose and use appropriate measurement methods, - prepare and implement school physics experiments; Practical skills: - demonstrate school experiments; - organize student physics experiments; - use basic measuring instruments and devices. - demonstrate correct experimental habits and skills when working independently in a physics laboratory.	
Syllabus/Indicative Content: Principles and legislation of occupational safety in the physical laboratory. The role of experiment in the process of physical cognition. Physical quantities and units. Older systems of units . International System of Units SI. Measurement of physical quantities. Preparation of measurement. Methods of measurement. Sequential, group, interpolation method. Least	

squares method. Measurement errors. Sources of errors. Types of errors. Systematic errors. Random errors of direct measurements. Statistical treatment of measurement results. Computational methods for processing measurement results. Graphical methods for processing measurement results. Basic measuring instruments and measurement procedure in mechanics and molecular physics. Basic measuring instruments and measurement procedure in electricity and magnetism. Basic measuring instruments and measurement procedure in optics. Basic measuring instruments and measurement procedure in atomistics and nuclear physics. Methodology of processing a physical measurement protocol.

Suggested readings:

1. Koubek, V. a kol.: Školské pokusy z fyziky, SPN Bratislava 1991
2. Pokusy z fyziky na ZŠ
3. Pokusy so súpravou SEG
4. Učebnice fyziky pre 6. roč. ZŠ diel A, B
5. Učebnice fyziky pre 1. roč. Gymnázia
6. Tabuľky pre ZŠ, SPN Bratislava 1985
7. Brož, J. a kol.: Základy fyzikálních měření I. Praha, SPN 1983
8. Tutorials

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Dr. h. c. doc. PaedDr. Vladimír Šebeň, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KVKSTR	**Title of Course:** Selected problems of Theory of relativity
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 6th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: During the semester, the student prepares, presents at the seminar and submits the seminar paper - on a selected topic. During the examination period, he performs a knowledge test. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Knowledge: - Define the principles of the special theory of relativity - Define basic laws within special relativistic kinematics and dynamics - Apply spacetime geometry to selected phenomena - Analyze physical phenomena - aberration, Doppler phenomenon, collision of the same surface-charged particles, ... - within the framework of this theory - Work with tensor notation in the special theory of relativity Skills: - Demonstrate knowledge and understanding of scientific facts, definitions - Apply knowledge from the general theory of relativity when creating preparations during pedagogical practice - To apply the laws of ŠTR when solving physical problems - Apply the laws of ŠTR when studying related subjects - for example, cosmology Competencies: - Competences related to learning outcomes - Professional-subject competences – physics teacher as a guarantor of conveying scientific foundations through the application of modern progressive methods; - Organizational and management competences – a teacher able to plan his activities;	

- Diagnostic and intervention competences – a teacher able to diagnose the problem of his students;
- Competences of reflection of one's own activity – a teacher capable of reflecting, evaluating and modifying one's own educational activities.

Syllabus/Indicative Content:
History of Physics and experiments leading to the special theory of relativity. The principles of special relativity. Lorentz transformation and its physical consequences. Minkowski space time. The light cone. Relativistic dynamics - štvorvektory, rel. equation of motion, rel. energy conservation laws. Relativistic electrodynamics - tensor form of Maxwell's equations.

Suggested readings:

1. Kvasnica, J.: Teorie elektromagnetického pole. Academia Praha, 1985.
2. Landau, L. D., Lifšic, Je. M.: Úvod do teoretickej fyziky 1, Bratislava 1980.
3. Brdička, M., Hladík, A.: Teoretická mechanika. Praha 1988.
4. Salák, M.: Úvod do špeciálnej teórie relativity. CD záznam prednášok, Univerzitná knižnica PU v Prešove, 2003.

Language of Instruction: Slovak language

Other course information:

Grading history
Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Doc. RNDr. Mária Csatáryová, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll*.)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KINVPP	**Title of Course:** Internet in Natural Sciences education
Type, scope and method of educational activities: Compulsory Elective course **Form of Study:** Excercise **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 60 hours** Direct education: 10 hours Self-study: 30 hours Guided work: 20 hours	
Number of credits: 2	
Semester: 6th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Learning outcomes: The subject is completed with an interim assessment. During the semester, the student works independently on assigned topics and presents 2 papers at pre-determined seminars, receiving 10 points for each presentation, a total of 20. The resulting assessment includes the assessment for presentations and participation in seminars during the semester. Pass criteria: A: 100.00-90.00 %; B: 89.99-80.00 %; C: 79.99-70.00 %; D: 69.99-60.00 %; E: 59.99-50.00 %; FX: 49.99 and less.	
Aims and Objectives: Knowledge: - With the topics discussed, the student can orient himself in terminology, acquires knowledge of the use of websites in teaching, can evaluate specific situations. Skills: A graduate of the subject primarily knows: - search for internet resources on a given topic, - search for bibliographic resources in the library information system, - select suitable literary sources for the given topic from various sources, - interpret the content of the www page with the selection of important information, - design a lesson model on a selected topic with inserted electronic elements, - work in database systems. Competencies: Graduate of the subject - knows how to navigate newly discovered websites and can "download" the necessary information, be it text, images, ... - can evaluate the security risks of using ICT.	
Syllabus/Indicative Content: Use of information and communication technologies in the teacher's work; internet, multimedia and computer teaching programs, their function and method of use, work with	

search and school systems. Lesson models using ICT. Work in the Edupage system, work with the „Planéta vedomostí“ - "Knowledge Planet" portal.

Suggested readings:

1. Conferences proceedings: Poznatky modernej fyziky a ich aplikácia do vyučovania fyziky.
2. Planetavedomosti.sk, www.fyzika.sk,www.fyzikahrou.cz/fyzika/jednoduche-pokusy
3. www.walter-fendt.de/ph14sk/ (java aplety pre fyziku)
4. www.nauctesaviac.sk

Language of Instruction: Slovak language

Other course information:

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: Doc. RNDr. Mária Csatáryová, PhD.

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KVCEL	**Title of Course:** Beekeeping
Type, scope and method of educational activities: Elective course **Form of Study:** lecture **Number of contact hours:** 0/1 **per week:** 0/1 **per level/semester: 0/13** **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 10 hours Guided work: 10 hours	
Number of credits: 1	
Semester: 1st, 3rd, 5th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Graduated. Assessed credit. Attendance at seminars is mandatory. A student can have a maximum of 2 absences justified on the basis of a medical certificate. In case of unjustified non-participation or a large number of absences, the student will not be granted credits. The evaluation of the student's study results within the study subject will take place: (a) active participation	
Aims and Objectives: Learning outcomes: **Acquired knowledge:** Student: - acquires basic theoretical and practical knowledge about beekeeping, - is able to describe the life of bees, - can describe basic work procedures in beekeeping, - can describe problems related to beekeeping. **Acquired skills:** Student: - acquires practical skills with beekeeping - can interpret the acquired knowledge in his own words, - can apply the acquired knowledge in the implementation of practical tasks, - can think critically, formulate own conclusions and defend them. **Acquired competences:** Student: - can apply acquired knowledge and skills, - can solve professional tasks, - knows how to coordinate partial activities and work collectively, - can take responsibility for the tasks and results of their work, - has developed competencies for further self-education, - can use acquired theoretical knowledge and practical skills in solving problems in the field of beekeeping.	
Syllabus/Indicative Content: 1-2. The current state of beekeeping and its importance for society 3. Biology of the honey bee 4. Bee diseases - prevention and therapy 5. Zootechnics of beekeeping 6.Bee grazing 7.-8 Bee	

products 9. Bee breeding and mother breeding 10. History of beekeeping 11- 13. Inspection of beehives according to the development of beehives

Suggested readings:
ČERMÁK, K. a kol., PSNV, VČELÁŘSTVÍ I., 2016,
DANIHLÍK, J. a kol., PSNV, VČELÁŘSTVÍ II., 2017
GRUNA B. a kol., PSNV, VČELÁŘSTVÍ III., 2020

Language of Instruction: Slovak language

Other course information:

Grading history

A	B	C	D	E	FX

Lecturer/Instructor:
doc. Mgr. Peter Manko, PhD. – lecturer, examiner
RNDr. Radoslav Smoľák, PhD. – lecturer, examiner
doc. Ing. Jozef Oboňa, PhD. – lecturer, examiner

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Prešov in Prešov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2BIO/KDBIOL	**Title of Course: History of biology**
Type, scope and method of educational activities: Elective course **Form of Study:** seminars **Number of contact hours:** 1/0 **per week:** 1/0 **per level/semester:** 13/0 **Study method:** combined **Student workload: 30 hours** Direct education: 10 hours Self-study: 15 hours Guided work: 5 hours	
Number of credits: 1	
Semester: 4th semester	
Degree/Level: 1st degree (Bachelor)	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous evaluation. Successful fulfillment of the conditions of the mid-term evaluation - seminar tasks. The point score will be evaluated at the end of the semester. Success criteria: A: 100.00 - 90.00%; B: 89.99-80.00%; C: 79.99-70.00%; D: 69.99-60.00%; E: 59.99-50.00%; FX: 49.99% and less.	
Aims and Objectives: **Knowledge gained:** The student can: - classify the main stages of the history of biology; - briefly characterize the individual stages from the Paleolithic to the present day; - describe important milestones in the history of biology; - interpret the most significant discoveries, theories, laws and their contribution to biological scientific disciplines; - to know important figures in the history of biology and their contribution. **Skills Acquired:** The student: - can solve tasks independently; - can present and defend own opinions; - can discuss a specific issue; - can work with professional literature independently. **Acquired competences:** The student: - can apply acquired knowledge and skills in further study; - can solve professional tasks; - knows how to coordinate partial activities and work collectively; - can take responsibility for the results of his work.	
Syllabus/Indicative Content: • Biological knowledge in prehistoric times, early science • First civilizations as a milestone in the human history • Ancient States (Mesopotamia, Egypt, India, China) • Ancient Greece and Rome	

- Biology in the Middle Ages - Europe
- Biology in the Middle Ages - Byzantine and Arabian Empire
- The Renaissance period and its influence on the formation of biological sciences
- Modern times in biological disciplines
- Milestones of the present

Suggested readings:

ZIGOVÁ, M. 2017. Dejiny biológie. ISBN 978-80-555-1912-8
POSPÍŠIL, M.F. 2002. Biológia človeka 1. Univerzita Komenského, ISBN: 80-223-1542-
SOUKUP, V. 2006. Dejiny antropológie. Praha. ISBN 80-246-0337-3
BAČKOR, M. 2007. Dejiny biológie. Interný učebný text. [Online]. Dostupné na: http://martinbackor.science.upjs.sk/material/sdb.pdf
RÁDL, E. 2005. Dějiny biologických teórií novověku I. Praha: Academia. ISBN 80-200-1363-6
RÁDL, E. 2005. Dějiny biologických teórií novověku II. Praha: Academia. ISBN 80-200-1363-8

Language of Instruction: Slovak language

Other course information: Two justified absences are tolerated in the seminars.

Grading history

Total number of evaluated students:

A	B	C	D	E	FX

Lecturer/Instructor: RNDr. Michaela Zigová, PhD., - examiner, seminar leader

Last update: 30 September 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: *University of Presov*	
Faculty: *Faculty of Humanities and Natural Sciences*	
Code: *2EKO/NANOM*	**Title of Course:** Nanomaterials
Type, scope and method of educational activities: Voluntary subject **Form of Study:** Lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 4., 5.	
Degree/Level: 1.	
Prerequisites:	
Grading Policy (Assessment/Evaluation): Continuous examination on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: - will gain knowledge about preparation methods, morphology and character of the structure of selected nanomaterials, characterization of physical phenomena in these systems at the nano-level, and an overview of important nanotechnological applications in technical practice. Acquired knowledge: Student: - have an overview of the development of the science of nanomaterials; - acquires knowledge about methods of characterizing the morphology and structure of nanomaterials; - have an overview of important nanotechnological applications in practice. Acquired skills: Student: - know how to prepare nanocolloidal solutions of metal nanoparticles; - be able to use laboratory methods for characterizing the optical properties of nanomaterials. Acquired competences: Student:	

- the student acquires communicative competences, can explain the used procedures, analyses;
- can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities;
- able to express himself professionally;
- can work independently with literature, address experts in the given field, etc.;
- acquires professional competences within his field.

Syllabus/Indicative Content:
Nanostructured materials: nanocomposites, nanoparticles and nanocapsules, carbon-based nanostructures (fullerenes and nanotubes), thin layers and coatings, nanowires, dentrimers, quantum dots. Overview of important nanotechnological approaches: bottom-up methods, top-down methods, self-organized nanostructures. Experimental methods of studying the structure and properties of materials at the nano-level (STM, AFM, HRTEM, ...) Nanotechnologies in technical practice: applications in energy, sensors, robotics, magnetic recording and medicine.

Suggested readings: Selected scientific papers.

Language of Instruction: Slovak, English

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/KOOCHEM	**Title of Course:** Coordination chemistry
Type, scope and method of educational activities: Voluntary subject **Form of Study:** Lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: *2*	
Semester: 4., *5.*	
Degree/Level: *1.*	
Prerequisities:	
Grading Policy (Assessment/Evaluation): Evaluation and completion of study of the subject: Mandatory student participation in seminars. In case of absence, the teacher will determine an alternative way of conducting the seminar. Micro-performance in the form of a presentation on a given topic. Specific topics will be distributed at the beginning of the semester (40% of the final grade). Final credit (60% of the final assessment). **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - acquire basic knowledge about coordination compounds, donor-acceptor bond, properties of complexes; - will gain an overview of natural coordination compounds and the use of complexes in medicine and industry. Acquired skills: Student: - learn how to solve practical problems in the field of coordination chemistry. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content: Definition of coordination chemistry. Basic concepts and historical introduction. Donor-acceptor bond. Ligands. Nomenclature of coordination compounds. Organometallic	

compounds. Chelate effect. Structure of coordination compounds. Isomerism. Stability of coordination compounds. Synthesis of coordination compounds. Coordination compounds in biological systems. Metalloproteins and metalloenzymes. Coordination compounds in medicine and in analytical chemistry. Industrial use of coordination compounds.

Suggested readings:

G.L. Miessler, P.J. Fischer, D.A. Tarr. Inorganic Chemistry. 5th ed. Pearson Education, Inc., 2014. ISBN 978-0-321-81105-9.
G.A. Lawrance. Introduction to Coordination Chemistry. John Wiley & Sons Ltd., 2010, ISBN 978-0-470-51930-1.
B. Weber. Coordination Chemistry: Basics and Current Trends. Springer Spektrum, 2023, ISBN 978-3-662-66440-7.
J. Černák. Úvod do koordinačnej chémie. UPJŠ v Košiciach, 2021, ISBN 978-80-574-0019-6.
J.R. Gispert. Coordination Chemistry. John Wiley & Sons Ltd., 2008, ISBN 978-3-527-31802-5.

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/PRCHEM	**Title of Course:** Industrial Chemistry
Type, scope and method of educational activities: Voluntary subject **Form of Study:** Lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 4., 5.	
Degree/Level: 1.	
Prerequisites:	
Grading Policy (Assessment/Evaluation): Continuous examination on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - obtains information about basic chemical productions and technologies; - acquires knowledge about the main raw materials for the chemical industry. Acquired skills: Student: - be able to compare the environmental impact of basic processes and operations in the production of the most important chemical products; - be able to calculate the quantitative parameters of the effectiveness of chemical processes. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.;	

- acquires professional competences within his field.

Syllabus/Indicative Content:

Forms of occurrence of the most important primary inorganic raw materials. Overview of methods of processing the most important ore raw materials. Overview of methods of processing the most important non-mineral raw materials. Important inorganic technologies Basic processes based on coal, oil, natural gas. Use of synthesis gas. Oil processing, cracking, pyrolysis processes. Production of basic alkenes, arenes and acetylene. Production of alcohols (methanol, ethanol) and polyols (ethylene oxide, glycerol, pentaerythritol). Industrial oxosyntheses. Electrophilic reactions on aromatic hydrocarbons. Alkylation of benzene, production of styrene, cumene, phenol and acetone. Production based on phenol. FriedelCrafts acylations. Nitration and reduction of aromatic nitroderivatives. Isocyanates. Hydrogenation of aromatics. Production based on acetylene and ethylene. Acetic acid, peracetic acid, ketene chemistry, acetic anhydride. Production based on higher alkenes, dienes. Metatheses of alkenes. Oxidations of hydrocarbons, alkylbenzenes, production of terephthalic acid, phthalic anhydride, maleic anhydride. Oxidations of cyclohexane - production of cyclohexanone, adipic acid and caprolactam. Amoxidation, production of nitriles. Production of the most important heterocycles (pyridine, alkylpyridines, pyrimidines, etc.). Amines from alcohols.

Suggested readings:

1. Mocik S., Šimek Z., Halásová R. Chemická technológia pre učiteľov. Bratislava : SPN, 1980
2. M. Linkešová, I. Paveleková. Vybrané kapitoly z chemickej a potravinárskej technológie. 2007. 237s. ISBN 978-80-8082-170-8
3. K. Weissermel, H.-J. Arpe: Industrial Organic Chemistry. 2nd ed. VCH 1993.

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/MEDCHEM	**Title of Course:** Medicinal Chemistry
Form of Study: *lectures 1 hour per week, seminars course 1 hour per week* **Number of contact hours:** **per week:** *1+1***per level/semester:** *lectures 10 hours, seminars 10 hours, self-study 40 hours* **Method of study:** *full-time study*	
Number of credits: *2*	
Semester: *4., 5.*	
Degree/Level: *1.*	
Prerequisites:	
Grading Policy (Assessment/Evaluation): Compulsory participation. The examiner assesses if, and in that case how, absence can be compensated. Written report and oral presentation on a specific topic, which will be assigned at the beginning of the course. (30 %). Final written exam (70 %). Success criteria (percentage): A: 100 - 90 %; B: 89 - 80 %; C: 79 - 70 %; D: 69 - 60 %; E: 59 - 50 %; FX: 0 - 49 %.	
Aims and Objectives: Acquired knowledge: Student: - have an overview of bridging knowledge from chemistry, medicine and pharmacy; - becomes familiar with the physico-chemical properties of drugs and their biological activity. Acquired skills: Student: - to have a broader picture of the issue of research and development of new drugs; - to have an overview of new trends in medicinal chemistry. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	
Syllabus/Indicative Content: Introduction to medicinal chemistry. Definition of medicinal and pharmaceutical chemistry. Drug discovery, design and development. Physical-Chemical Factors and Biological Activities. Drug targets and active sites of biomolecules (lipids, proteins, enzymes, receptors, nucleic acids). Molecular Modeling and Drug Design. Selected topics in medicinal chemistry. Anaesthetics. Sedatives and Hypnotics. Antibiotics. Analgesics. Anticonvulsants. Antiviral agents. Antineoplastic agents. Agents for Diagnostic imaging. Vitamins. Medicinal chemistry of herbs.	

Suggested readings:

M. Remko. Základy medicínskej a farmaceutickej chémie, 3. Vydanie, Remedika, 2019. ISBN 978-80-972954-1-7.
A. Kar. Medicinal Chemistry. New Age International (P) Ltd. Publishers, 2007. ISBN 978-81-224-2305-7.
G. L. Patrick. An Introduction to Medicinal Chemistry. 5th ed., Oxford University Press, 2013. ISBN 978–0–19–969739–7.
M. W. Harrold, R. M. Zavod. Basic Concepts in Medicinal Chemistry. 3rd ed., American Society of Health-System Pharmacists, Inc., ISBN 978-1-58528-694-2.
G. Thomas. Medicinal Chemistry. 2nd ed., John Wiley & Sons Ltd, 2007. ISBN 978-0-470-02597-0.

Language of Instruction: Slovak

Other course information:

Grading history:

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:

doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2EKO/PERSCHEM	**Title of Course:** Perspectives of chemistry 1
Type, scope and method of educational activities: Voluntary subject **Form of Study:** Lecture, seminar **Number of contact hours:** 2 **per week:** 1+1 **per level/semester:** 26 **Student workload:** 60 hours **Direct education:** 20 hours **Self-study:** 30 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 2	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Continuous examination on seminars - 30 %. Final evaluation - 70 %. Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: Student: - will gain an overview of the extensive scope of chemistry in various fields, perspectives of chemistry; - to know about the application of chemistry in various segments and practical life. Acquired skills: Student: - will be able to analyze the relationship between the properties of chemical substances and their use in practical life in various areas. Acquired competences: Student: - the student acquires communicative competences, can explain the used procedures, analyses; - can apply this knowledge when solving chemical and non-specialist tasks related to everyday experience as well as professional activities; - able to express himself professionally; - can work independently with literature, address experts in the given field, etc.; - acquires professional competences within his field.	

Syllabus/Indicative Content:
Natural and artificial radioactivity around us. Applications of nuclear technologies. Total chemical analysis. Coordination Chemistry and Crystal Engineering. Modern trends in material chemistry. The position of chemistry in the development of new drugs. Nanochemistry. Green analytical chemistry and its contribution to environmental protection. Molecular chameleons. Principles of bioorganic and medicinal chemistry - relationship of organic molecules to biomacromolecules, drug development. Organic compounds for the pharmaceutical industry and optoelectronics.

Suggested readings:
1. Koskinen, A. M. P. Asymmetric Synthesis of Natural Products; Wiley: Chichester, 2012.
2. Lindhorst, T. K. Essentials of Carbohydrate Chemistry and Biochemistry; Wiley-VCH: Weinheim, 2007.

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor:
doc. Ruslan Mariychuk, CSc. - lectures, seminars
RNDr. Romana Smolková, PhD. - lectures, seminars

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.

Course Information Sheet (*in the structure according to Decree No 614/2002 Coll.*)

University: University of Presov	
Faculty: Faculty of Humanities and Natural Sciences	
Code: 2FYZ/KMETEO	**Title of Course:** Meteorology
Type, scope and method of educational activities: Voluntary subject **Form of Study:** Lecture **Number of contact hours:** 1 **per week:** 1/0 **per level/semester:** 13/0 **Student workload:** 30 hours **Direct education:** 10 hours **Self-study:** 10 hours **Guided work:** 10 hours **Study method:** combined	
Number of credits: 1	
Semester: 4.	
Degree/Level: 1.	
Prerequisities: -	
Grading Policy (Assessment/Evaluation): Learning outcomes: The assessment will consist of the following parts: • feedback sheet on exercises 25% • seminar work 20% • presentation of the seminar work in the form of a report at the seminar 10% • final paper 45% Success criteria (percentage): a) A - 100.00 - 90.00% b) B - 89.99 - 80.00% c) C - 79.99 - 70.00% d) D - 69.99 - 60.00% e) E - 59.99 - 50.00% f) FX - 49.99 and less%. **Method of evaluation and completion of study of the subject:** Continuous evaluation.	
Aims and Objectives: Acquired knowledge: - Understand basic concepts correctly - Describe the regularities of physical events taking place in atmospheric conditions - Apply the basics of thermodynamics and statics to the atmosphere model - Define the basics of synoptic meteorology - Define optical and electrical phenomena in terms of physical laws - Define the basics of dynamic meteorology - Define the basics of climatology Skills: - Process and interpret measured data - It can analyze the measured meteorological elements and analyze the main objects when creating a weather forecast - Apply knowledge when preparing for lessons during pedagogical practice	

Competencies:
Graduate of the subject
- Can correctly interpret the manifestations and causes of climate change.

Syllabus/Indicative Content:
Atmosphere - composition, pressure, temperature, density. Basic meteorological elements and phenomena. Radiation and thermal regime of the atmosphere. Thermodynamics of the atmosphere. The movement of air and heat in the atmosphere. Wind conditions in the atmosphere. Electrical and optical phenomena in the atmosphere. Structural analysis of the atmosphere. The main meteorological objects. The analysis and forecast. Large capacity air flow. Basics bioclimatology. Environmental aspects.

Suggested readings:

1. Meteorologický slovník výkladový terminologický, Academia Praha, 1993
2. Kobzová, E. Počasí. Olomouc. Rubiko, 1998
3. Zverev: Synoptická meteorológia. Alfa Bratislava, 1986

Language of Instruction: Slovak

Other course information:

Grading history

A	B	C	D	E	FX
0%	0%	0%	0%	0%	0%

Lecturer/Instructor: Doc. RNDr. M. Csatáryová, PhD.

Last update: 14. October 2024

Approved by: doc. Ruslan Mariychuk, CSc., guarantor.