Compulsory Subjects

1. Psychology of Childhood and Education
2. **Environmental Science**
3. Chemistry and Society
4. **Laboratory Practicum I**
5. Pedagogical Communication and School Evaluation
6. **Introduction to Ecosystem Sciences**
7. **Basics of Statistics**
8. **Research Project Internship**
9. Inclusion in Education
10. **Global Environmental Problems**
11. **Environmental Education in the School Environment**
12. School Policy and Administration
13. **Practical Solutions to Environmental Problems**
14. **Environmental Management**
15. Planning, Development and Implementation of Curriculum
16. **Environmental and Green Technologies**
17. **Sustainable Development**
18. **Bachelor's Thesis Defense**
19. **Renewable Energy Sources**
20. Environmental Policies and Law
21. **Professional Internship I**

Compulsory Elective Subjects

1. Teaching Profession and Professional Ethics
2. Biological Aspects of Pupil Development
3. Concept of Learning and Education
4. Problem Behaviour of Pupils
5. History of Institutional Education
6. Reading and Media Literacy
7. Academic Writing
8. Culture of Teacher's Speech and Cultural Literacy
9. **Geographic Information Systems**
10. **Remote Sensing of the Earth**
11. **Introduction to Radioecology**
12. **Security of Environmental Data and Information**
13. Fundamentals of Population Ecology
14. Communication of Environmental Topics
15. Environmental Ethics
16. Crisis Management, Mediation / Association
17. **Environmental Monitoring and Bioindicators**
18. **Methods of Ecological Research**
19. **Fundamentals of Research Project Preparation**
20. **Toxicological Aspects in Environmental Components**
21. **Laboratory Practicum II**
22. **Professional Internship II**

Profile subjects

Compulsory Subjects

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Psychology of Childhood and Education
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours): 2** **Weekly:** 2/0 **During the study period:** winter **Method of educational activity:** combined	
Number of credits: *3*	
Recommended semester of study: 1.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous Assessment:

Participation in lectures and discussions, ongoing study of the recommended literature (20 points).

Final Assessment:

The subject will be completed with a written knowledge test (80 points).

Completion:

Based on continuous and final assessment. A minimum of **56% of the total score** is required to earn credits.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

During the subject, students will become familiar with the basic knowledge and core theories of psychological development, as well as with the terminology and methodology of developmental psychology. They will acquire the ability to reflect on developmental psychology findings concerning the conditions and mechanisms of psychological development in specific stages and areas.

The outcome of the subject is the acquisition of a broader conceptual and knowledge background necessary for the work of a teacher and for their further professional development through the study of relevant psychological literature.

Brief Subject Outline:

- Subject, terminology, and legitimacy of contemporary developmental psychology;
- Conditions and mechanisms of psychological development, research methodology, and tools for exploring psychological reality;
- Cognitive development from the perspective of major developmental theories – psychological mechanisms of cognition; the most significant educational implications;
- Development of language, speech, and literacy in the context of a wide range of educational domains and academic subjects;
- Psychological aspects of secondary socialization – socio-psychological mechanisms of learning and principles of adopting social norms;

- Key milestones in the continuity of identity development, social mechanisms and conditions shaping personal, social, and cultural identity;
- Specific features of psychological development of today's generation of schoolchildren in the context of current societal, cultural, and civilizational changes at various developmental stages and during adolescence (selected topics);
- Developmental psychological prerequisites for education in marriage and parenthood;
- Current risks and threats to the psychosocial development of youth in the context of modern information and communication technologies;
- Current topics in the profession of school psychologist – issues of inclusion of pupils with specific educational needs (children from socially disadvantaged backgrounds, cultural and language minorities, and other at-risk groups).

Recommended literature:

- Vágnerová, M.: Vývojová psychologie I. Dětství a dospívání. Praha: Karolinum, 2005.
- Jursová - Zacharová, Z. Od narodenia po maturitu: Poznatky vývinovej psychológie v kontexte vzdelávania. Bratislava: Univerzita Komenského, online, 2021.
- Psychický vývoj dítěte. Pražská skupina školní etnografie. Praha: Univerzita Karlova, 2005.
- Petrová, Z. Vygotského škola v pedagogike. Trnava: Typi, 2008
- Štech, S., Zapletalová, J. Úvod do školní psychologie. Praha: Portál, 2013
- Lukšík, I., Lemešová, M. Deti v ťažkých životných situáciách. Trnava : Typi Universitatis Tyrnaviensis, 2013.
- Erikson, E. H. 2002. Dětství a společnost. Praha : Argo, 2002.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. PhDr. Oľga Zápotočná, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Environmental Science
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours): 6** **Weekly:** 3/3 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *8*	
Recommended semester of study: 1.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Final assessment: Standard completion – examination
Form of completion: Active participation in lectures and seminars, seminar paper
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
The student understands the causes of phenomena leading to environmental problems and the interconnections between the environment and human activity. They comprehend the basic concepts related to environmental protection. They can identify the consequences of environmental pollution and understand the mechanisms behind global issues such as the greenhouse effect, ozone layer depletion, acid rain, etc. In practical terms, they gain experience in implementing nature and environmental protection measures.

Brief Subject Outline:

- Environment of organisms, factors and resources.
- Abiotic factors, radiation and heat.
- Biotic factors, intraspecific and interspecific relationships.
- Threats to and protection of fauna and flora.
- Basic biogeochemical cycles and the role of biotic systems in chemical processes in the environment.
- Environmental monitoring of water, soil, and air pollution.
- Sources of radioactive contamination.
- Methods of pollutant removal – physical, chemical, biological.
- Current state of natural and environmental conditions in Slovakia and their protection.

Recommended literature:

- Peterková, V., Iľko, I. 2020. Environmentalistika pre pedagogické fakulty. Pedagogická fakulta Trnavskej univerzity, Trnava.
- Fazekašová a kol.: Chemické a environmentálne aspekty zložiek životného prostredia. Prešovská univerzita, 2014. ISBN 978-80-8165-081-9

- Frankovská, J. a kol. Atlas sanačných metód environmentálnych záťaží. Štátny geologický ústav Dionýza Štúra Bratislava 2010

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. Ing. Viera Peterková, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** Chemistry and Society

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 6
Weekly: 3/3
During the study period: winter
Method of educational activity: combined

Number of credits: *8*

Recommended semester of study: 2.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Continuous assessment:
To complete the subject, 100% attendance at lectures and seminars is required, along with home preparation in the form of studying recommended literature. During seminars, the student will prepare an assigned project on the topic of the role of chemistry in various areas of society from the consumer's perspective. The project accounts for 25% of the total subject grade.
Final assessment:
Completion by examination.
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon successful completion of the subject Chemistry and Society, the student will be able to:

- Formulate and express their own opinions on issues related to the use of chemistry in various areas of everyday life;
- Interpret the physicochemical principles behind the functioning of cleaning agents, cosmetics, pharmaceuticals, fertilizers, and pesticides;
- Identify and characterize the function of food additives, as well as the composition of polymers and catalysts;
- Recognize the applications of new materials in society;
- Evaluate the “chemical fate” of micropollutants and nanomaterials.

Brief Subject Outline:
TEACHERS:

- Substances vs. chemicals
- Chemical literacy
- Safety when working with chemicals
- Fundamentals of chemistry
- Chemistry of carbon compounds

- Cleaning agents and household chemicals
- Cosmetic products
- Pharmaceuticals
- Agrochemicals (fertilizers and pesticides)
- Food additives
- Macromolecular substances (natural and synthetic)
- Polymers and plastics
- Nanomaterials and micropollutants

SEMINARS:

- Testing basic laws and calculations necessary for understanding mass balances in systems with and without chemical processes, multi-component systems, and charge balances
- Student presentations of science communication projects focused on thoroughly elaborating socially discussed topics related to chemistry

Recommended literature:

- REGULI, J. a kol.: Spotrebiteľská chémia. Vyd. PdF TU 2015, 172 str., ISBN 978-80-8082-861-5
- REGULI, J. a kol.: Chémia a spoločnosť. Vyd. Typi Universitatis Tyrnaviensis, 2018, 572 s. ISBN 978-80-568-0156-7.
- BALÁŽ, P. a kol.: Chémia materiálov. Bratislava: Veda, 2014, 200 s. ISBN 978-80-224-1360-2.
- BOČA, R. Všeobecná chémia. UCM, 2008, 244 s. ISBN 9788081050794
- SCHWARZ, M. Chémia životného prostredia. TU vo Zvolene, 2016, 430 s. ISBN 978-80-228-2917-5.
- VOLLMANNOVÁ, A. a kol.: Chémia potravín. Nitra: SPU, 543 s. ISBN 978-80-552-1814-4.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Martin Pipíška, PhD., doc. RNDr. Vladimír Frišták, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** Laboratory Practicum I

Type of educational activities: exercises; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 4C
During the study period: winter
Method of educational activity: combined

Number of credits: *6*

Recommended semester of study: 2.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Ongoing assessment:
Regular attendance and submission of all laboratory reports. During the semester, students will complete short written quizzes before each laboratory session (to pass the session, a minimum of 56% must be achieved). For each session, students are required to submit a laboratory report (to pass the session, a minimum of 56% of the report score must be achieved).
Final assessment: Final written test.
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon completion of the subject Laboratory Practice, the student:

- will acquire the necessary laboratory experience: knows laboratory tools and their purposes, can independently prepare a laboratory bench for a given task, can recognize and handle laboratory glassware and basic measuring instruments;
- can apply basic chemical procedures and methodologies in laboratory practice;
- will gain skills in assembling simple apparatus, calculating and preparing starting materials, as well as obtaining reaction products in the required quantity.

Brief Subject Outline:

1. **Laboratory safety** – chemical effects, risk prevention, substance labelling
2. **Basic laboratory equipment** – materials used in the laboratory, working with glassware
3. **Basic laboratory operations I** – solution preparation, heating, dissolving, suction
4. **Basic laboratory operations II** – weighing, working with automatic pipettes and their calibration
5. **Distillation, sublimation, and crystallization**
6. **Use of pH meter/multimeter** – measurement of pH, conductivity, total dissolved solids, and dissolved oxygen

7. **Filtration and substance separation** – using filter paper and syringe filters, centrifugation, vacuum evaporation
8. **Determination of solubility of substances**
9. **Determination of the acidity constant (Ka) of a weak acid**
10. **Determination of NaOH concentration by thermometric titration**
11. **Chromatographic separation of substances** – thin-layer chromatography (TLC), column chromatography
12. • **UV/VIS spectrophotometry** – calibration curve construction, concentration determination

Recommended literature:

- PAVELEKOVÁ, I.; ŽOLDOŠOVÁ, K.: Laboratórne cvičenia z analytickej chémie. Trnava : PdF TU, 2001. 79 s. ISBN 80-88774-94-2.
- JURAŠEKOVÁ, Z. Laboratórna technika a výpočty, UPJŠ, 2025, ISBN 978-80-574-0381-4 (e-publikácia)
- VRANOVIČOVÁ, B.: Laboratórne cvičenia zo všeobecnej chémie (4. vydanie). Trnava: UCM, 2019. 77 s. ISBN 978-80-572-0024-6.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Martin Pipíška, PhD., doc. RNDr. Miroslav Horník, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Pedagogical Communication and School Evaluation
Type of educational activities: lecture/seminar **Scope of educational activities (in hours):** 4 **Weekly:** 2/1 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *3*	
Recommended semester of study: 2.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Final assessment: During the semester, the student is required to complete four interim seminar assignments, in which they attempt to apply theoretical knowledge to the design of specific didactic interventions aimed at effective pedagogical communication and evaluation. The methodological proposals are formatively assessed throughout the semester with the aim of developing the target competences of this subject and are subsequently evaluated on a scale of 0–10 points for each completed assignment (a total of 40 points for continuous assessment). Emphasis is placed on the student's ability to connect theory with concrete practical proposals and to support them with appropriate argumentation.

During the subject, the student is expected to engage in self-study, focusing on recommended literature and the identification of theoretical principles of effective pedagogical communication and school evaluation. In addition to the continuous preparation of partial tasks for individual seminars, the student must also complete four seminar papers.

As part of the final assessment, the student completes a written exam (maximum of 60 points). Credits will not be awarded to any student who receives 0 points in any part of the evaluation.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

The student is able to apply the principles of pedagogical communication in such a way that the educational process under their guidance leads to optimal educational outcomes.
The student understands the importance of continuous feedback and designs pedagogical interventions to provide students with adequate formative feedback.
The student is able to design various methods of pedagogical diagnostics of students and can justify the choice of diagnostic methods based on their intended purpose.
The student is able to propose specific tools for pedagogical diagnostics and can explain the rationale behind the chosen approach.
The student is familiar with various traditional and alternative forms of educational assessment and can evaluate their strengths and weaknesses in relation to the specific educational context in which the assessment is applied.

Brief Subject Outline:

- Importance and forms of pedagogical communication between teacher and students
- The nature of teacher's questions and feedback for students
- Communication as a tool for building respectful teacher-student relationships
- Dialogic teaching – an optimal model of education based on communication
- Pedagogical diagnostics of the student as a means of improving the teacher's educational influence
- Methodological rules for pedagogical diagnostics of students
- Implicit and explicit student diagnostics; edumerical and case-based approaches to pedagogical diagnostics
- Initial, formative, and summative diagnostics; diagnostics of students' cognitive and affective traits and of peer relationships within the classroom
- Diagnostics of students' creativity; diagnostics of the student's family environment; diagnostic methods
- Knowledge and skills tests – types of test items, item analysis, test validity, reliability, and testing pitfalls
- The essence and importance of assessment in school, its tasks and functions; forms of student assessment – what and how to assess; most common assessment errors; impact of assessment on teaching effectiveness
- Fair assessment as a prerequisite for the development of students' self-assessment
- Student evaluation and classification, grading systems, descriptive assessment, portfolio-based assessment, alternative assessment methods

Recommended literature:

- Šeďová, K., Svaříček, R., Šalamounová, Z. (2012). Komunikace ve školní třídě. Praha : Portál. 296 s. ISBN: 9788026200857.
- Kolář, Z., Šikulová, R. (2009). Hodnocení žáků. Praha : Grada, 218 s. ISBN 978-802-4728-346.
- Gavora, P. (2003). Učiteľ a žiaci v komunikácii. Bratislava : Univerzita Komenského. 197 s. ISBN: 80-223-1716-0.
- Gavora, P. (2010). Akí sú moji žiaci? Pedagogická diagnostika žiaka. Nitra : Enigma Publishing, s.r.o. 216 s. ISBN: 978-80-89132-91-1.
- Mareš, J., Křivohlavý, J. (1995). Komunikace ve škole. Brno : Masarykova univerzita. 210 s. ISBN 80-210-1070-3.
- Mistrík, J. (1999). Vektory komunikácie. Bratislava : Univerzita Komenského. ISBN 80-223-1320-3.
- Slavík, J. (1999). Hodnocení v současné škole. Praha : Portál. ISBN 80-7178-262-9.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PaedDr. Kristína Žoldošová, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Introduction to Ecosystem Sciences
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *5*	
Recommended semester of study: 2.	
Level of study: 1.	
Prerequisite subjects:	

Continuous assessment: Active participation in seminars, seminar paper
Final assessment: Written and oral exam
Completion method: Exam
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

- The student will acquire basic concepts and phenomena related to ecology, particularly ecosystems.
- They will be able to explain fundamental relationships, the dynamics of matter, and the energy balance within ecosystems, and will understand the functioning of ecosystems from local to global systems, i.e. the biosphere.
- The acquired knowledge will be applied in other scientific disciplines, especially in environmental science and practice.
- The student will be able to identify major ecological problems at the ecosystem level and propose basic solutions to these issues.
- They will develop ecological and ecosystem thinking and will be able to evaluate the importance of this knowledge for human life needs.

Brief Subject Outline:

- Individual, population, and community and their adaptations to ecological factors.
- Biocenosis and biotope as ecological systems.
- Communities of major world regions.
- Structure, functions, and properties of ecosystems.
- The biosphere as a global system.
- Current ecological problems of the Earth and their solutions.

Recommended literature:

- Trnka, A. 2020. Ekológia a environmentálna výchova 1. Pedagogická fakulta Trnavskej univerzity, Trnava.
- Begon, M. a Townsend C. R. 2021. From Individuals to Ecosystems. Wiley; 5th edition,

- Townsend, C. R., Begon, M., Harper, J. L. 2010. Základy ekologie. Univerzita Palackého, Olomouc.
- Raffaelli D. G. 2010. Ecosystem Ecology. Cambridge University Press, Cambridge.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Alfréd Trnka, PhD.

Date of last update: 26.03.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** Research Project Intership

Type of educational activities: excursion, field practice; *profile subject*
Scope of educational activities (in hours): 8
Weekly: 8
During the study period: summer
Method of educational activity: combined

Number of credits: *14*

Recommended semester of study: 2.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Continuous assessment:
A prerequisite for completing the subject is 100% participation in excursions and field practices, as well as the submission of written records. During the field practices, the student completes an assigned research task and prepares a project, which is presented at the end of the semester.
Final assessment: oral exam.
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon completion of the subject ***Research Project Intership***, the student will be able to:

- Formulate and express personal viewpoints on issues related to contamination and environmental protection.
- Identify and characterize the function of individual components of the environment.
- Become familiar with the use of new approaches in environmental protection.
- Propose their own concept for solving a given environmental issue.
- Apply practical skills in fieldwork aimed at environmental monitoring and analysis of the quality of individual environmental components (soil, water, air), sample collection (including plants and samples for microbiological analysis), and in situ monitoring and analysis of environmental quality components.

Brief Subject Outline:

1. **Field research** carried out in cooperation with partner institutions of the Faculty of Education at TRUNI and the Faculty of Natural Sciences at UCM in Trnava (e.g. the State Nature Conservancy or the National Agricultural and Food Centre; joint project implementation, existing Cooperation Agreements), focused on sampling various abiotic (water, soil substrates) and biotic components of the environment (especially plant samples).
2. **In-situ measurements** aimed primarily at assessing basic physical-chemical and chemical parameters (e.g. pH, conductivity, TDS, content of selected macro- and

micronutrients/metals, soil compaction, tension, moisture, and others) using portable measuring devices, analyzers, and test kits.
3. **Laboratory analysis** of a portion of the collected samples, their processing and preparation under laboratory conditions.
4. **Use of lysimetric techniques and equipment.**
5. **Selection of terrain and topic** correlated with the subjects taught within the bachelor's study program.

Recommended literature:

- KRÁLIKOVÁ, R. (ed) 2019. Monitoring a diagnostika životného prostredia. Košice: Technická univerzita v Košiciach, 120 s. ISBN 978-80-55327-26-6.
- JÚDOVÁ, J. (ed) 2008. Environmental monitoring/Environmentálny monitoring. Žilina: Ústav vysokohorskej biológie Žilinskej univerzity, 134 s. ISBN 978-80-88923-17-6.
- WIERSMA, B. G. 2004. Environmental Monitoring. Boca Raton: CRC Press, 792 s. ISBN 978-15-66706-41-4.
- ZHANG, C. 2007. Fundamentals of Environmental Sampling and Analysis. Wiley, 456 s. ISBN: 978-0-470-12067-5.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Martin Valica, PhD. ,doc. RNDr. Vladimír Frišták, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Inclusion in Education
Type of educational activities: lecture/seminar **Scope of educational activities (in hours):** 4 **Weekly:** 2/1 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *4*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

Active participation in seminars and the completion of seminar assignments throughout the semester, based on the criteria specified at the initial seminar session, will be evaluated with a maximum of 50 points. The student must earn at least 25 points from the continuous assessment. Part of the subject completion also includes the **non-contact part of the subject**, which primarily consists of studying and analytical work with recommended literature, independent preparation for the seminar part of the subject according to given instructions, group work, preparation of a seminar paper, and preparation for the final test.

Final assessment:

Written final test: maximum 50 points. The student must earn at least 26 points from the written part.

Method of completion:

The final grade will include the student's performance during the semester (min. 25 – max. 50 points) and the written knowledge test (min. 26 – max. 50 points).

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

- Upon completing the subject, the student will gain basic orientation in the theoretical foundations, legislative framework, and issues related to the preparation and evaluation of inclusive education in early childhood.
- The student is able to identify and explain potential barriers that children with diverse needs may have to overcome in early education settings.
- The student can analyze the educational environment in terms of the degree of inclusion.
- The student is able to propose conditions and principles whose implementation in schools and the educational process will foster progress toward inclusive practices in education.
- The student can provide arguments in favor of elements that promote inclusivity in the educational process.
- The student can identify the challenges and difficulties that the concept of inclusion brings for various educational stakeholders.

Brief Subject Outline:

- **Basic conceptual grounding** – medical vs. social perspectives on diversity in society (inclusion, integration, social exclusion, assimilation, etc., and their theoretical sources).
- **Socio-cultural framework of inclusion** (international and national legislation and other educational and political documents that define the framework for current efforts in inclusive education).
- **Transdisciplinary approach**, key components of inclusive education.
- **Children with diverse needs in education**: opportunities and barriers to meeting their needs (children with disabilities, children from socially disadvantaged backgrounds, gifted children, children with a different mother tongue, etc.).
- **Models, possibilities, and principles of inclusive education** (international and Slovak experiences: implementing inclusive elements in education, inclusive educational programs, examples of good practice, international inspirations).
- **Human resources for inclusive education** (inclusive teams, responding to teachers' needs, cooperating institutions).
- **Evaluation of the educational environment in terms of inclusion** (possibilities for analyzing the current state of education from an inclusion perspective, evaluation and self-evaluation criteria and tools for assessing the quality of inclusive education).
- **Ethical issues of inclusive education**.

Recommended literature:

- BOOTH, T. 2019. Index inklúzie. Bratislava: Nadácia pre deti Slovenska.
- GALLOVÁ KRIGLEROVÁ, E. 2010. Žiaci zo znevýhodneného prostredia v Slovensku a zahraničí. Bratislava: SGI.
- HÁJKOVÁ, V. - STRNADOVÁ, I. 2010. Inkluzivní vzdělávání. Teorie a praxe. Praha: Grada.
- HAUG, P. 2017. Understanding inclusive education: ideals and reality. Scandinavian Journal of Disability Research. Vol. 19, No. 3, 206-217.
- KLEIN, V. – ŠILONOVÁ, V. 2014. Pedagogický model inkluzívneho vzdelávania v základných školách. Prešov: MPC.
- LECHTA V. a kol. 2016. Inkluzivní pedagogika. Praha: Portál.
- MICHALÍK, J. – BASLEROVÁ, P. – FELCMANOVÁ, L. a kol. 2015. Katalog podpurných opatření pro žáky s potřebou podpory ve vzdělávaní z duvodu zdravoního nebo sociálního znevýhodnení. Olomouc: Univerzita Palackého v Olomouci.
- Stratégia inkluzívneho prístupu vo výchove a vzdelávaní. Bratislava: MŠVVaŠ SR.
- ŠPOTÁKOVÁ, M. a kol. 2018. Od integrácie k inklúzii. Bratislava: VÚDPaP.
- VLADOVÁ, K., LECHTA, V. a kol. 2017. Aplikácia vzdelávacích programov pre žiakov so zdravotným znevýhodnením a všeobecným intelektovým nadaním. Bratislava: ŠPÚ.
- VORLÍČEK, R. 2019. Jak se daří inkluzi u nás a na Slovensku? Hradec Králové: Pavel Mervart.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. PhDr. Ivan Lukšík, PhD., Mgr. Markéta Filagová, PhD.

Date of last update: 24.05.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Environmental Education in the School Environment
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours): 5** **Weekly:** 2/3 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *7*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Final assessment:

Consists of the evaluation of the environmental project and the final written exam.

Method of completion:

Students actively participate in mandatory instruction.
A minimum of 75% active attendance in seminars is required, as well as submission and completion of seminar assignments within the set deadlines.
The completion of the subject also includes the non-contact part of the subject, self-study of the recommended literature, and preparation of the environmental project.
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

- Evaluate the methods and forms of environmental education and assess their effectiveness in terms of developing students' attitudes and values.
- Identify and discuss students' alternative conceptions of environmental problems and their solutions.
- Assess the possibilities for influencing students' and the public's attitudes toward the environment.
- Analyze the factors influencing the environmental behavior of individuals and groups (values, attitudes, knowledge, cultural, economic, and social factors).
- Critically evaluate the implementation of environmental activities and programs (e.g. projects, awareness campaigns, community initiatives).
- Acquire knowledge of didactic approaches to basic environmental education topics (e.g. waste, biodiversity, climate change, glacier melting, and others).
- Flexibly solve assigned pedagogical and environmental tasks, reflecting the specifics of different target groups.

- Implement, modify, and adapt environmental education methods and activities, including experiential, inquiry-based, discussion methods, and games.
- Critically analyze the factors affecting the success of environmental education and propose measures for its improvement.

Brief Subject Outline:

1. **Introduction to environmental education.** Origins, importance, and development of environmental education. The difference between ecology, environmental science, ecological and environmental education. History of the emergence of environmental education.
2. **Objectives, principles, and importance of environmental education.** Environmental education goals according to international and national documents. Education for values and responsibility for the environment. Principles and cross-curricular themes within the education system.
3. **Content and forms of environmental education.** Cross-curricular themes in school curricula. Integration with other subjects and practical application (horizontal and vertical integration). Organizational forms: classroom teaching, excursions, field exercises, projects.
4. **Methods of environmental education.** Traditional and active teaching methods. Experiential, inquiry-based, and problem-oriented learning. Examples of innovative approaches and games.
5. **Factors influencing environmental behavior.** Internal and external factors (attitudes, knowledge, cultural and social aspects). Motivation and barriers to environmental behavior. The importance of the teacher and personal example.
6. **Programs and approaches in environmental education.** Directions of environmental education (ecological, technological, economic, political, existential approaches). Ethical concepts (ecocentric, theocentric, social ethics). Examples of campaigns, wilderness education, and education for sustainable development.

Recommended literature:

- GALLAYOVÁ, Z. 2007. Environmentálna výchova, Zvolen: Technická univerzita vo Zvolene, Fakulta ekológie a environmentalistiky, 2007. 82 s. ISBN 978-80-228-1820-9.
- IĽKO I., PETERKOVÁ V. 2020. Environmentalistika pre pedagogické fakulty. Trnava 2020. ISBN 978-80-568-0294-6.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. Ing. Viera Peterková, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** School Policy and Eadministration
Type of educational activities: lecture **Scope of educational activities (in hours): 2** **Weekly:** 2/0 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *3*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous Assessment:

Preparation of a thematic assignment (maximum 40 points, minimum 20 points).

Final Assessment:

Final test (maximum 60 points, minimum 30 points).

Method of Completion:

The final grade is the sum of the continuous assignment and the final test (maximum 100 points, minimum 50 points).

The **thematic assignment** is prepared by the student by selecting one of the topics from the subject syllabus. The paper must be 5 pages long. It is assessed based on the selection of sources, text structure, level of synthesis, accuracy of academic writing, and topical relevance.

The **test** consists of closed-ended items and includes both factual and application-oriented questions. It evaluates the student's understanding of relevant subject content and the ability to apply that knowledge in teaching practice.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

The student:

- understands the basic principles of education governance at national and international levels.
- is able to identify policies that influence decision-making in education at both the system-wide and component levels.
- can anticipate the development of the education system in the near future.
- is familiar with school legislation and applies it to the needs of teaching practice.
- knows the institutional structure of the entire education system and the power distribution among the various actors who shape and implement educational policy.

Brief Subject Outline:

1. Education policy and its key actors in national and international contexts

2. Main outlines of the development of education policy in the Slovak Republic during the 20th century up to the present
3. The architecture of the Slovak education system in the context of international comparisons
4. Central, regional, and local authority in education governance
5. Policies shaping early and preschool education
6. Policies shaping primary education
7. Policies shaping upper secondary education and vocational training
8. Curriculum and textbook policy
9. Policies related to the teaching profession and their legislative framework
10. Support services in the school system
11. School administration and school documentation agenda

Recommended literature:

- European Commission/ EACEA/ Eurydice, 2018. The Structure of the European Education Systems 2018/ 19: Schem atic Diagram s. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union European Commission/EACEA/Eurydice, 2021. Compulsory Education in Europe – 2021/22. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.
- International Standard Classification of Education 2011. Montreal, UNESCO Institute of Statistics, 2012.
- Kaščák, O., Pupala, B. Škola zlatých golierov Vzdelávanie v ére neoliberalizmu. Praha: Sociologické nakladatelství (SLON), 2012, 208 s.
- Kalous, J., Veselý, A. (Eds.) Teorie a nástroje vzdělávací politiky. Praha: Karolinum, 2007.
- Kaščák, O., Pupala, B., Marchevský, P. Vybrané aspekty školskej politiky v optike slovenskej verejnosti. Bratislava: Centrum pedagogického výskumu v ÚVSK SAV, 2012, 68 s.
- Pupala, B.: Vzdelanie - školská politika - kultúra. Bratislava: Raabe, 2022.
- Rehúš, M.: Analýza kurikula v základných školách. Encyklopedizmus náš kadodenný. Bratislava: IVP MŠVVŠ SR. https://www.minedu.sk/data/att/13792.pdf Rehúš, M.: Analýza kariérového systému učiteľov na Slovensku. IVP MŠVVŠ SR. https://www.minedu.sk/data/att/11848.pdf
- Zákon č. 596/2003 Z. z. o štátnej správe v školstve a školskej samospráve a o zmene a doplnení niektorých zákonov v znení neskorších predpisov
- Zákon č. 245/2008 Z. z. o výchove a vzdelávaní (školského zákona) a o zmene a doplnení niektorých zákonov
- Zákon č. 317/2009 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. PhDr. Branislav Pupala, CSc.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Practical Solutions to Environmental Problems
Type of educational activities: lecture/exercises; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *8*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Final assessment: Standard completion – exam
Mode of completion: Active participation
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

- Apply the acquired competencies in environmental education in pedagogical practice, with emphasis on the development of environmental awareness and responsible behavior.
- Discuss the significance and practical implications of current environmental issues at local, regional, and global levels.
- Design environmental educational programs and activities for various age and target groups, focusing on their implementation in pedagogical practice.
- Plan, design, implement, and evaluate simple environmental observations, activities, and projects (including field-based ones).
- Implement theoretical knowledge of environmental education into pedagogical practice and the future teaching profession.
- Present and defend the results of own environmental projects and activities.
- Acquire basic pedagogical skills necessary for implementing environmental education, including the development of lesson units and teaching plans.

Brief Subject Outline:

1. Non-governmental organizations and extracurricular activities

- The role of NGOs, eco-centers, zoos, and botanical gardens
- Cooperation between schools, the public, and the community

2. Evaluation and assessment of environmental programs

- Importance and types of evaluation
- Creation and assessment of the effectiveness of environmental programs
- Examples of research and evaluation in environmental education

3. Psychological aspects of individuality

- Developmental specifics (from childhood to adulthood)
- Influence of emotional and ethical aspects on education
- Education for self-awareness and appreciation of nature

4. Contemporary challenges and ethical aspects of environmental education

- The relationship between a consumer lifestyle and the environmental crisis
- Personal responsibility, modesty, and values
- The impact of advertising, media, and societal norms on attitudes

Recommended literature:

- FRYKOVÁ, E. 2010. Environmentálna výchova vo vyučovacom procese. 1. vydanie. Bratislava : Metodicko-pedagogické centrum, 2010. 56 s. ISBN 978-80-8052-348-0.
- ROSOVÁ, V., BIANCI, G. 1993. Environmentálna výchova v rodine a škole/ Umwelterziehung in Familie und Schule. Bratislava : Goethe-Institut, 1993; Bratislava: KVSBK SAV, 1993. - 92, 96 s. - ISBN 80-900981-3-4.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. Ing. Viera Peterková, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Planning, Development and Implementation of Curriculum
Type of educational activities: lecture/seminar **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *5*	
Recommended semester of study: 5.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

Active participation in seminars (at least 75%, 10 points), submission and completion of continuous assignments within the set deadline (40 points).

A prerequisite for completing the subject is also the implementation of its non-contact part – through self-study. This includes: studying the recommended literature, working on assignments, and preparing for the final test.

Final assessment:

Successful completion of continuous assessment and passing the written part of the exam is a prerequisite for taking the oral exam (50 points).

Completion:

Credits will not be awarded to a student who scores 0 points in any part of the assessment.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

The student:

- is familiar with various levels of curriculum and curriculum documents (especially in connection with their field of study),
- uses basic professional terminology of curriculum theory,
- applies basic professional terminology of curriculum theory to describe, analyze, interpret, and evaluate selected curriculum documents,
- is able to plan instruction, formulate and analyze educational objectives, and use relevant resources for lesson preparation and delivery,
- applies principles for selecting, implementing, and organizing learning activities.

Brief Subject Outline:

- Basic sources and concepts in curriculum studies, forms of curriculum existence
- Curriculum documents
- Educational objectives
- Didactic transformation of content, selection and organization of content

- Disciplinarity, interdisciplinarity, school subjects, educational areas
- Instructional design, the teacher's role in curriculum implementation, principles for selecting and conducting learning activities
- Textbooks, workbooks, teaching guides and other materials. Teaching methods
- Organization of instruction
- Planning and development of school curriculum, teacher's work with curriculum

Recommended literature:

- JANÍK, T., MAŇÁK, J., KNECHT, P. Cíle a obsahy školního vzdělávání a metodologie jejich utváření. 1. vyd. Brno: Paido, 2009. ISBN 978-80-7315-194-2
- PASCH, M. a kol.1998. Od vzdělávacího programu k vyučovací hodině. Praha: Portál.
- DVOŘÁK, Dominik. Od osnov ke standardům : proměny kurikulární teorie a praxe. Praha: Univerzita Karlova v Praze, Pedagogická fakulta, 2012.
- KALHOUS, Z., OBST, O. 2002. Školní didaktika. Praha : Portál. ISBN 80-7178-253-X
- GINNIS, P. 2017. Efektivní výukové nástroje pro učitele. Praha: Euromedia Group.
- Curriculum documents
- Current documents and reports related to education at ISCED 2 and ISCED 3 levels

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PaedDr. Katarína Kotuľáková, PhD., doc. PaedDr. Jana Fančovičová, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** Environmental and Green Technologies

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/0/2
During the study period: winter
Method of educational activity: combined

Number of credits: *6*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Subject Completion Requirements:
Ongoing assessment: The students' acquired knowledge and competencies will be verified during the semester by a midterm test. Only students who achieve at least 56% of the points on this midterm test will be allowed to take the final exam. For laboratory exercises, regular attendance and submission of all lab reports will be required.
During the semester, students will take short written quizzes before each laboratory session (to pass the session, at least 56% of the points must be achieved). For each session, students will submit a laboratory report (to pass, they must achieve at least 56% of the points for the report).
Final evaluation:
Completion method: Exam
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon completing the subject "Environmental and Green Technologies", the student will be able to:

- Define environmental and green technologies;
- Explain the principles of sustainable development and circular economy;
- Understand the use of environmental and green technologies for the efficient utilization of renewable resources, especially biomass, the production of alternative fuels, and the reduction of environmental burdens;
- Apply acquired theoretical knowledge to promote environmental awareness;
- Demonstrate skills and experience in applying selected environmental and green technologies in practice, acquired through laboratory exercises and field excursions.

Brief Subject Outline:

1. Environmental and Green Technologies – Introduction to the Topic
2. Principles of Sustainable Development, Green Economy, and Circular Economy

3. Green Chemistry and Material Innovations
4. Bioplastics and Other Bioproducts, the Concept of Biorefineries
5. Renewable Raw Materials and Energy Sources
6. Biofuels – First, Second, Third, and Fourth Generation
7. Recycling and Environmental Recycling Technologies
8. Remediation and Bioremediation Technologies, Biotransformation and Biodegradation of Hazardous Substances
9. Biosorption and Phytoremediation
10. Green Technologies in Urban Environments
11. Environmental Management and Environmental Impact Assessment
12. Economic Aspects of Implementing Environmental and Green Technologies

Laboratory Exercises:

1. Laboratory Safety, Introduction to Basic Laboratory and Experimental Techniques
2. Testing of Selected Bacterial Strains as Polyhydroxyalkanoate Producers
3. Biomass Production Assessment in Various Algae and Cyanobacteria Species under Given Cultivation Conditions
4. Fermentative Production of Ethanol from Starchy Materials
5. Use of Laccases for the Removal of Organic Contaminants from Aquatic Environments
6. Biosorption of Synthetic Dyes or Heavy Metals
7. Removal of Heavy Metals from Contaminated Water Using Plants

Recommended literature:

- BEHERA, B.K., PRASAD, R. Environmental Technology and Sustainability - Physical, Chemical and Biological Technologies for Clean Environmental Management. Elsevier, 2020, ISBN 978-0-12-819103-3.
- URMINSKÁ, D. a kol. Environmentálna biotechnológia. SPU Nitra, 2024, ISBN 978-80-5522728-3
- FRANKOVSKÁ a kol. Atlas sanačných metód environmentálnych záťaží. Štátny geologický ústav Dionýza Štúra, Bratislava 2010, 360 s, ISBN 978-80-89343-39-3
- TRÁVNIČEK a kol. Technologie zpracování biomasy za účelem energetického využití. Mendelova univerzita v Brne, 2015, 212 s. ISBN 978-80-7509-206-9.
- PIPÍŠKA, M., FRIŠTÁK, V.: Biouhlie v manažmente životného prostredia I. Technológia produkcie, štruktúra a vlastnosti. Trnavská univerzita, 2020, 96 s., ISBN 978-80-568-0352-3.
- VALICA, M., HORNÍK, M.: Laboratórne cvičenia z remediačných technológií. Fakulta prírodných vied UCM v Trnave, 2024, 150 s. ISBN 978-80-572-0463-3.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Martin Pipíška, PhD., doc. RNDr. Miroslav Horník, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Professional Internship I
Type of educational activities: training (internship), *profile subject* **Scope of educational activities (in hours): 5** **Weekly:** 5h/ weekly **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *10*	
Recommended semester of study: 6.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject: Completion by internship and presentation of internship outcomes

Learning Outcomes:

After completing the subject, the student:

- Is able to navigate the practical functioning of environmental activities in the school environment, including school clubs and extracurricular groups.
- Gains experience in planning and implementing environmentally focused leisure activities for pupils of various age categories.
- Can identify opportunities to integrate sustainable development and environmental education topics into school life.
- Is able to collaborate in the creation and operation of coordination councils within projects such as the Eco School (Zelená škola).
- Acquires practical skills in organizing environmental events and campaigns in the school environment (e.g. Earth Day, green planting, recycling activities).
- Can apply theoretical knowledge of environmental education when preparing and conducting activities in school clubs for children.
- Develops teamwork skills with school staff and pupils during the implementation of environmental projects.
- Gains skills in documenting, reflecting on, and evaluating educational activities with an environmental focus.
- Can present the results of their work and reflect on the significance of environmental education for the school and community.
- Gains basic administrative and communication skills essential for involving the school in environmental programs and grant schemes.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Brief Subject Outline:

Introduction to school and pedagogical practice – familiarization with the objectives of the subject and the importance of environmental activities in the school environment (school, school club, extracurricular groups, leisure activities).

Observation of the school environment – observing the organization of school life, the school club, and leisure activities; identifying opportunities for environmental education.
Participation in selected school activities – assisting in organizing environmental events, creating bulletin boards, participating in school clubs and activities such as the Eco School.
Design and implementation of one's own activity – preparing and conducting a small environmental activity or project in the school setting, with emphasis on the age-specific characteristics of pupils.
Cooperation with teachers and the environmental education coordinator – meetings, reflection, sharing experiences, and developing proposals for coordinating the school's environmental activities.
Reflection and final evaluation of the practice – preparing outputs and self-reflection, presenting experiences and recommendations for future pedagogical practice in environmental education.

Recommended literature:

Language required for subject completion: english

Notes:

Subject Evaluation:
Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. Ing. Viera Peterková, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Compulsory elective subjects

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Teaching Profession and Professional Ethics
Type of educational activities: lecture **Scope of educational activities (in hours): 1** **Weekly:** 1 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *2*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Subject Completion Requirements:
Final assessment: Final test during the exam period worth 100 points.
Completion method: The subject is completed by a written exam. Credits will not be awarded to a student who scores less than 56 points.To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
After completing the subject, the student will be able to:

- Assess the characteristics of the teaching profession with regard to the sociological concept of a profession.
- Describe tools (both legislatively defined and in the context of lifelong learning) for teacher professionalization.
- Justify the importance of professionalization and identify potential weak points.
- Evaluate possible moral dilemmas in teaching in the context of various ethical theories.
- Assess the individual demands of the Teacher's Code of Ethics in terms of their complexity.

Brief Subject Outline:

- Legitimacy of the school – Where does it come from? What weakens it?
- Is teaching a profession? – The concept of teacher professionalization.
- Moral vs. non-moral requirements placed on teachers
- General overview of ethics as a philosophical discipline
- Morals, morality, ethics, virtue – Selected ethical theories (virtue ethics, ethics of responsibility, consequentialist and deontological approaches)
- Applied ethics. Professional ethics.
- Professional ethics of a teacher. Code of ethics. Professional chamber.
- Teacher's Code of Ethics

Recommended literature:

- ŠTECH, S.1994. Co je to učitelství a lze se mu naučit? In. Pedagogika, (XLIV), 1, s. 310-320.
- PORUBSKÝ, Š. et al. 2014. Problém štandardizácie učiteľskej profesie v kontexte profesijného rozvoja učiteľov na Slovensku. Orbis Scholae, 8 (3), s. 23-46.
- VALENT, M. 2019. Plán profesijného rozvoja podľa novej legislatívy. Bratislava: MPC.
- VALENT, M. nedatované. Profesijný štandard v školstve. Dostupné na:
- https://archiv.mpc-edu.sk/sk/pedagogicke-rozhlady/clanky/profesijny-standard-v-skolstve
- Zákon o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov (č. 138, 2019 Zb.z.).
- LIESMANN, K.- ZENATY, G.1992. O myšlení. Praha: Votobia
- GLUCHMAN, V.- GLUCHMANOVÁ, M. 2009. Profesijná etika učiteľa. Brno: Tribun, s. 100 - 115.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PhDr. Ondrej Rajský, PhD., doc. Mgr. Zuzana Danišková, PhD.

Date of last update: 23.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Biological Aspects of Pupil Developlment
Type of educational activities: lecture **Scope of educational activities (in hours): 2** **Weekly:** 2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *2*	
Recommended semester of study: 2.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

Students actively participate in the compulsory instruction through active attendance at lectures and participation in group discussions.

Final assessment:

Oral examination

To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

Upon successful completion of the subject, the student will be able to:

- Define the biological determinants of human development.
- Identify the developmental stages of a child (prenatal period, newborn, toddler, preschool age, early and late school age, adolescence).
- Characterize the basic developmental changes of each stage in terms of physical and motor development.
- Distinguish the structure of body systems and evaluate their interconnection and continuity.
- Explain the function of individual body systems.
- Assess the age-specific features of the development of organ systems.

Brief Subject Outline:

- Ontogenetic development of humans
- Postnatal growth and development of humans I (Physical changes in different stages of ontogeny)
- Postnatal growth and development of humans II (Laws of physical growth and development; Growth curve; Regulation of growth and development; Acceleration and secular trend; Biological age; Biotypology and body composition; Norm and its significance)

- Age-specific characteristics of the development of the musculoskeletal system
- Age-specific characteristics of the development of the circulatory system
- Age-specific characteristics of the development of the digestive system
- Age-specific characteristics of the development of the respiratory system
- Age-specific characteristics of the development of the excretory system
- Age-specific characteristics of the development of the reproductive system
- Age-specific characteristics of the development of the nervous system
- Age-specific characteristics of the development of the endocrine system
- Age-specific characteristics of the development of the sensory systems

Recommended literature:

- Fančovičová, J., Prokop, P.: Biológia človeka pre učiteľské kombinácie s biológiou, Trnava: Pedagogická fakulta Trnavskej univerzity, 2010. - online, 138 s. - ISBN 978-80-8082-398-6
- Dylevsky, I., Trojan, S., 1984: Somatológia I., II., Osveta Bratislava.
- KOČÁREK, Eduard. Biologie člověka. Scientia, 2010.
- KOČÁREK, Eduard. Biologie člověka 1.: Somatologie, Antropologie, Fyziologie, Imunologie. 1. vyd. Praha: Scientia, 336 s. 2010.
- MACHOVÁ, Jitka. Biologie člověka pro učitele. Univerzita Karlova v Praze, Nakladatelství Karolinum, 2016. https://pdf.truni.sk/e-ucebnice/svdm/

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PaedDr. Jana Fančovičová, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Concept of Learning and Education
Type of educational activities: lecture **Scope of educational activities (in hours): 1** **Weekly:** 1 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *2*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Ongoing assessment:

During the semester, the student will prepare a seminar paper focused on a selected topic from the subject content, with a minimum length of 3,000 words. The assessment will consider the choice of sources, text structure, level of synthesis, correctness of academic writing, and topicality. The seminar paper can receive a maximum of 10 points.

Completion of the subject also requires participation in the non-contact part of the subject – through self-study. This includes: studying the recommended literature, preparing the seminar paper, and studying for the final test.

Final assessment:

Written knowledge test focused on factual knowledge and the ability to apply knowledge in educational practice, with a maximum score of 40 points. The student must score at least 21 points on the written test.

Completion requirement:

Credits will not be awarded to a student who scores 0 points in any part of the assessment.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

After completing the subject, the student will be able to:

- Explain what learning is, under what conditions and in what situations it occurs.
- Define various learning theories and their development within the evolution of psychological science.
- Clarify different learning theories and define their implications for understanding the process and outcomes of education.
- Apply and reflect on various conditions and means of school learning within the context of their subject specialization.
- Critically reflect on different conditions and means of school learning from the perspective of learning and education theories.

- Evaluate how different learning and education theories are applied in school and education reform.

Brief Subject Outline:

- **Definition of learning**, learning situations and influencing factors
- **Learning theories** in the development of psychological science (behavioral, humanistic, cognitive, constructivist, and social approaches) and dissubjects on education
- **Current state of learning psychology** (Bloom's taxonomy, cognitive learning theories, context-based learning theory)
- **Learning styles**
- **Learning and motivation**
- **Learning and communication**
- **Self-regulated learning**
- **Learning from text**
- **Learning from visual materials**
- **School reforms from the perspective of learning theories and educational concepts**

Recommended literature:

Bertrand, Y. (1998). *Soudobé teorie vzdělávaní*. Praha: Portál.
Illeris, K. (ed.). (2009). *Contemporary theories of learning. Learning theorists... in their own words*. New York: Routledge.
Kaščák, O., Pupala, B. (2009). *Výchova a vzdelávanie v základných diskurzoch*. Prešov: Rokus.
Průcha, J. (2020). *Psychologie učení. Teoretické a výzkumné poznatky pro edukační praxi.* Praha: Grada Publishing.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PhDr. Zuzana Petrová, PhD.

Date of last update: 23.4.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Problem Behaviour of Pupils
Type of educational activities: seminar **Scope of educational activities (in hours): 1** **Weekly:** 0/1 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *2*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

Students will complete ongoing seminar assignments worth a total of **50 points**.

During the semester, each student will prepare a seminar assignment focusing on a selected type of problematic behavior in children, considering possibilities of prevention and intervention. The assignment is worth a **maximum of 20 points**.

Students will also **present their seminar paper** according to the instructor's instructions and assigned topic, with a minimum length of **3,000 words**. The presentation is worth **30 points**.

Completion of the **non-contact part** of the subject (self-study) is also a requirement. This includes:

- studying recommended literature,
- preparing the seminar paper,
- and preparing for the final test.

Final assessment:

Final evaluation will consist of a **written or oral exam worth 50 points**.

To pass the exam, the student must earn at least **25 points**.

The final grade is based on the **sum of continuous and final evaluation**.

Credits will not be awarded to a student who:

- scores fewer than **56 points in total**, or
- scores fewer than **25 points on the written/oral exam**.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

After completing the subject, the student will be able to:

- Apply techniques for diagnosing and preventing socio-pathological phenomena.
- Adapt their behavior to the current and individual needs of children and pupils.
- Address and reduce emerging problems and undesirable behavior.
- Differentiate between the causes of problematic behavior and choose appropriate strategies for resolution.

- Apply knowledge from behavioral psychology and pathology prevention in communication with parents to identify possible solutions for problematic child behavior.
- Identify key institutions supporting healthy child development in cases of pathological manifestations – such as child psychologists, child psychiatrists, neurologists, or diagnostic centers – and demonstrate understanding of their roles and possibilities for cooperation.

Brief Subject Outline:

- Etiology of problematic behavior
- Aggression, defiance, violence. Aggressive behavior of pupils
- Bullying, cyberbullying and its prevention
- Self-harming behavior. Suicidal behavior
- Sexual abuse and sex education
- Trauma and its impact on child behavior
- Specific behavioral disorders (e.g., ADHD)
- Emotionally conditioned disorders
- Substance abuse. Non-substance addictions
- Diagnosis and prevention of problematic behavior
- Juvenile delinquency

Recommended literature:

- FREUD, S. 2016. Psychopatologie všedního života. Praha: Portál, 256 s. ISBN 978-80-262-1027-6
- KARIKOVÁ, S. 2007. Základy patopsychológie detí a mládeže. Žilina : IPV/EDIS, 146 s. ISBN 978-80-8070-757-6.
- MIŇHOVÁ, J., LOVASOVÁ, V. 2018. Psychopatologie - pedagogické, právní a sociální aspekty. Praha: Aleš Čenek, 238 s. ISBN 978-80-73807-21-4
- NAVRÁTIL, S., MATTIOLI, J. 2011. Problémové chování dětí a mládeže: Jak mu předcházet, jak ho eliminovat. Praha: Grada, 120 s. 978-80-247-7181-6
- SLOVÍKOVÁ, M. 2015. Problémové správanie u žiakov základných a stredných škôl. Bratislava : CVTI SR, 40 s. ISBN 978-80-89354-58-0
- SPUSTOVÁ IZAKOVIČOVÁ, G. 2020. Problémové správanie detí vo vyučovacom procese. Suchá nad Parnou: RUAH 71 s. e-book
- SVOBODA, J. 2014. Agrese a agresivita v předškolním a mladším školním věku. Praha: Portal, 168 s., ISBN: 978-80-262-0603-3
- SVOBODA, J. 2015. Krizové situace výchovy a výuky. Praha: Triton, 216s, ISBN978-80-7387-935-8
- ZEMANČÍKOVÁ, V. 2014. Problémové správanie žiakov a úloha sociálneho pedagóga v reflexii učiteľov. Sociální pedagogika| Social Education, 2(1), 22-36.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Lukáš Vaško, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** History of Institutional Education

Type of educational activities: lecture
Scope of educational activities (in hours): 1
Weekly: 1/0
During the study period: winter
Method of educational activity: combined

Number of credits: *2*

Recommended semester of study: 3.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Assessment:

- **Continuous assessment:** None
- **Final assessment:** Consists of a written test with 25 questions. The student can earn a maximum of 100 points (each question is worth 4 points).
- **Subject completion:** The subject is completed based on the final assessment.

Additional requirement for subject completion:
The student is required to complete the non-contact (self-study) part of the subject, which includes:

- Regular study of the material covered in the most recent lecture,
- Study of recommended literature,
- Study of electronic subjects available at: https://pdf.truni.sk/katedry/kps/pracovnici?kudlacova#veda-vyskum,

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon successful completion of the subject, the student will be able to:

- Understand and use basic terminology in the field of the history of education, and comprehend the key political, social, and cultural contexts of various historical periods, including the ability to describe their typical characteristics.
- Demonstrate knowledge of fundamental educational models in various historical periods and cultures of world, European, and Slovak history, describe them, and critically assess them in a broader context.
- Critically evaluate the current model of education in Slovakia, including the identification of its strengths and weaknesses.

Brief Subject Outline:

- Subject and aim of the subject "History of Institutional Education"; its significance in the context of pedagogical sciences.
- Origins of education in the civilizations of the ancient East and West; first European cultures and writing systems; education in ancient Greece and ancient Rome;

education in early Christian times and the Middle Ages (scholasticism, the phenomenon of the university); education during the Renaissance and Humanism; the Reformation and Counter-Reformation (Protestant and Jesuit education systems); the Enlightenment and Rationalism (school regulations, nationalization of education, compulsory schooling); education in the 19th century (the influence of Herbartianism on education); the reform pedagogical movement and its significance; political misuse of state education systems (socialism, fascism, Nazism); the postmodern crisis of education in Western European countries; the model of the unified socialist school in Eastern Europe.

- Development of institutional education in Slovakia with emphasis on the 20th century.
- Education after the fall of the Berlin Wall (globalization and economization of education). The school of the future?

Recommended literature:

- Kudláčová, B.: *Dejiny pedagogického myslenia I.* Trnava: Typi Universitatis Tyrnaviensis / VEDA, 2009.
- Kudláčová, B. (ed.): *Európske pedagogické myslenie (od antiky po modernu).* Trnava: Typi Universitatis Tyrnaviensis / VEDA, 2010.
- Kudláčová, B. – Rajský, A. (eds.): *Európske pedagogické myslenie (prechod od moderny k postmoderne po súčasnosť).* Trnava: Typi Universitatis Tyrnaviensis / VEDA, 2012.
- Kudláčová, B. (ed.): *Pedagogické myslenie, školstvo a vzdelávanie na Slovensku v rokoch 1918-1945.* Trnava : Typi Universitatis Tyrnaviensis/VEDA, 2016.
- Kudláčová, B. (ed.): *Pedagogické myslenie, školstvo a vzdelávanie na Slovensku v rokoch 1945-1989.* Trnava : Typi Universitatis Tyrnaviensis/VEDA, 2019.
- Bokorová, L.: *Dejiny výchovy a vzdelávania 1*. Trnavská univerzita, 2013.
- Feřtek, T.: *Co je nového ve vzdělávání*. Praha: Nová beseda, 2015.
- Kasper, T. – Kasperová, D.: *Dějiny pedagogiky*. Praha: Grada, 2008.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. PhDr. Ing. Blanka Kudláčová, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Reading and Media Literacy
Type of educational activities: lecture **Scope of educational activities (in hours): 2** **Weekly:** 2/0 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *3*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Completion: Exam
Ongoing Assessment: Participation in lectures and discussions, continuous study of the recommended literature (20 points)
Final Assessment: The subject will be completed with a written knowledge test (80 points)
Grading: Based on the sum of ongoing and final assessment. To earn credits, the student must achieve at least 56% of the total points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
The subject focuses on literacy issues in the context of today's information society and culture. Graduates will gain insight into current problems and challenges of the evolving information environment in education across a wide range of educational disciplines. The outcome of the subject is the reflection on their specific contributions, as well as on the role of academic subject teachers in developing functional reading and media literacy at the level of secondary education.

Brief Subject Outline:

- Conceptual and problematic definitions of literacy in contemporary society and culture; key concepts of the current academic dissubject on literacy ("multiliteracy", "disciplinary literacy", information, media, linguistic, and civic literacy);
- Traditions and problematic aspects of teaching reading and writing in the Slovak educational environment;
- Paradigm shifts in the theory and research of literacy (cognitive, sociocultural, and digital) and their contributions;
- Cognitive foundation of reading instruction in primary education: Metacognitive processes and strategies, reading reflection and regulation, guided and self-regulated learning, programs for developing metacognitive processes and learning strategies;
- Information literacy – specifics of literacy in the ICT environment, "old" vs. "new" forms of literacy, psychology of reading in traditional print vs. online formats (specifics,

benefits, and risks); professionalization of information work, the role of school libraries as modern library-information centers;
- Young people and social media, risk factors of today's information and media environment;
- Media literacy as a key 21st-century competence, media literacy and media competencies of youth in Slovakia, media education, international and domestic media education intervention programs and projects.

Recommended literature:

- Zápotočná, O. Kultúrna gramotnosť v sociálno-psychologických súvislostiach. Bratislava: Album, 2004.
- Zápotočná, O. Metakognitívne procesy v čítaní, učení a vzdelávaní. Trnava: Typi Universitatis Tyrnaviensis a VEDA, 2013.
- Zápotočná, O. Perspektívy vývinu čitateľskej gramotnosti v prostredí IKT: Potenciálne prínosy a riziká. In: Cenigová, R. (Ed.). Školské knižnice ako informačné a kultúrne centrá škôl. Bratislava: SPK, 2018. Recommended literature:
- Miklovičová, J., Valovič. J. (Eds.). 2021. Čitateľská gramotnosť: Výsledky slovenských žiakov v štúdii PISA 2018. Tematická správa. Bratislava: NÚCEM, 2021. Kapitola 3, s. 43-95. Dostupné na: https://www.nucem.sk/dl/4867/tematicka_sprava_citatelska_gramotnost_PISA_2018.pdf
- Danišková, Z. a kol. 2015. Občianska gramotnosť na primárnom stupni. Trnava: Typi Universitatis Tyrnaviensis a VEDA.
- Šušol, J., Hrdináková,Ľ., Rankov, P. Informačno-komunikačné technológie vo vzdelávaní. Bratislava: Stimul, 2005.
- Kohútová, V. , Lauterbachová, A., Madro, M, Horská, B. Správanie mladých ľudí a ich rodičov v online priestore (výsledky výskumu). 2018. http: //www.ipcko.sk/wp-content/uploads/2018/06/VY%CC%81STUPY-VY%CC%81SKUMU-1.pdf
- Gregor, M., Vejvodová, P. Zvol si info. Nejlepší kniha o fake-news, dezinformacích a manipulacích. Brno: CPress, 2018, 142 s. ISBN: 978-80-264- 1805-4 -K. Blažeková: Mediálna gramotnosť v prevencii negatívnych dôsledkov sociálnych médií. Dizertačná práca. Trnava: Pedagogická fakulta TU, 2021, 145 s.
- Časopisy:
- Journal of Adolescent a Adult Literacy Postition statements papers
- International Literacy Association: https://www.literacyworldwide.org/get-resources/position-statements/archive-ofposition-statements-papers
- Digital literacy, 2019: https://literacyworldwide.org/docs/default-source/where-we-stand/ila-digital-resources-early-childhood-literacy-development. pdf
- Disciplinary literacy, 2015: https://www.literacyworldwide.org/docs/default-source/where-we-stand/ccss-disciplinary-literacy-statement.pdf? sfvrsn=33beaf8e_12
- Adolescent literacy, 2019: https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-engagement- and-adolescent-literacy.pdf

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. PhDr. Oľga Zápotočná, CSc.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Academic Writing
Type of educational activities: seminr **Scope of educational activities (in hours): 2** **Weekly:** 0/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *3*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

During the semester, students will submit completed assignments (text processing in the form of paraphrasing, creating bibliographic records), for which they can earn a maximum of 20 points (10 points for each assignment).

A condition for completing the subject is also the implementation of the non-contact part of the subject – through self-study. This includes studying the recommended literature, improving one's own written expression, and preparing materials for writing an academic seminar paper in the form of an academic essay.

Final assessment:

At the end of the semester, the student submits a final written assignment in the form of a seminar paper or academic essay, for which a maximum of 80 points can be awarded.

Evaluation criteria for the academic essay:

- Use of sources (peer-reviewed and up-to-date sources, minimum 8) – 20 points
- Spelling and stylistic quality – 20 points
- Content processing (clarity of the topic/issue, argumentation, structure) – 20 points
- Formatting (length of 5 to 10 standard pages, proper text layout, paragraphs, etc.) – 20 points

If the student fails to submit the evaluated assignment by the deadline, 10 points will be deducted from the final score.

If the student submits a paper that is plagiarized, they will not be allowed to rewrite it and will automatically receive 0 points.

To successfully complete the subject, the student must earn at least 40 points from the academic essay.

Subject completion:

The final grade is based on the total score from both continuous and final assessment.

Credits will not be awarded to a student who fails to meet the minimum criteria of continuous assessment or earns 0 points in any part of the evaluation.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

Upon completion of the subject, the student will be able to:

- Search for relevant professional information sources;
- Distinguish between correct and incorrect paraphrasing/citation;
- Apply knowledge of proper paraphrasing and citation when writing academic texts;
- Format the text in an appropriate academic manner;
- Critically assess the linguistic quality of various academic texts;
- Justify the importance of training teachers in working with information sources.

Brief Subject Outline:

- Standardized language norms and codification manuals. Technical standards ISO 690 and ISO 690:2012.
- Specifics of academic texts. Paraphrasing and citation. Citing electronic and non-standard sources. Citing sources with incomplete publishing information. Reference list.
- Suprasentential units of the text – chapter, subchapter, paragraph. Structural composition of academic texts. Searching for relevant information sources.

Recommended literature:

- *Pravidlá slovenského pravopisu*. 4., nezmenené vydanie. Red. M. Považaj. Bratislava: Veda 2013.
- Slovenská technická norma ISO 690.
- Techniky a príklady citovania podľa STN ISO 690: 2012. MPC : Bratislava 2018.
- Smernica rektora Trnavskej univerzity v Trnave č. 20/2011.
- KATUŠČÁK, D.: Ako písať záverečné a kvalifikačné práce. ENIGMA 2013.
- TURABIAN, K.: A Manual for Writers of Research Papers, Theses, and Dissertations. 9. ed. Chicago : The University of Chicago Press 2018.
- MIKUŠIAK, M.: Esej. In: Jazykovedný časopis, Roč. 65, č. 1 (2014), s. 37-50. Dostupné na: https://www.degruyter.com/downloadpdf/j/jazcas.2014.65.issue-1/jazcas-2014-0003/jazcas-2014-0003.pdf
- MIKUŠIAK, M.: Ako na seminárnu, bakalársku, diplomovú prácu. [online prednáška] Avalaible on: https://pdf.truni.sk/katedry/ksj/pracovnici?mikusiak#materialy

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Jana Fúsková, PhD., Mgr. Marek Mikušiak, PhD.

Date of last update: 01.9.2024

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Culture of Teacher's Speech
Type of educational activities: seminar **Scope of educational activities (in hours): 2** **Weekly:** 0/2 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *3*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Subject completion: Final exam.
Continuous assessment:
Each student will deliver an educational presentation during the semester on a specific language-cultural topic (as assigned). The presentation must be supported by a clear PowerPoint presentation and should emphasize fluency, clarity of speech, interaction with peers, and adherence to the standard language norm.
The maximum score for the seminar presentation is 20 points:

- 10 points for a clear and factually accurate presentation,
- 10 points for the form of the educational contribution – standard language use, clarity, appropriate delivery, and creative elaboration of the topic (own examples, exercises, etc.).

Independent study is a mandatory part of subject completion. This includes studying the recommended literature, practicing presentation and public speaking skills, improving one's language expression, and preparing for the final exam.
Final assessment:
The final exam will be conducted in written form with a maximum score of 80 points. The student must obtain at least 40 points to pass.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Familiarization with the issue of language culture as a theoretical discipline and with the state of language culture in society. By completing the subject, students will gain an overview of language culture as a cultural phenomenon of society, as well as acquire practical language and cultural habits.

Brief Subject Outline:

- Fundamentals of the theory of the standard language – language norm and usage.
- Language culture and the codification concept anchored in legislative or state documents (Act No. 270/1995 Coll. on the State Language of the Slovak Republic / Concept of Care for the State Language in the Territory of the Slovak Republic).

- Language counseling and language criticism.
- The status and use of the state language in the field of education within the Slovak Republic.
- The influence of teachers on the formation of pupils' language habits (explicit vs. Implicit pedagogical influence).
- Classification of language errors and language innovations.
- Fundamentals of orthoepy and the culture of speech expression.
- Prosodic features of speech and their functional use in teaching. Psychological aspects of public speaking.

Recommended literature:

- DOLNÍK, J.: Teória spisovného jazyka so zreteľom na spisovnú slovenčinu. Bratislava : Veda 2010.
- RENDÁR, Ľ.: Kultúra učiteľovej reči. Trnava : PdF TU 2013. Dostupné na http://pdf.truni.sk/e-ucebnice/kur/
- MISLOVIČOVÁ, S. a kol.: Slovenčina na každý deň. Bratislava : Veda 2020.
- CRYSTAL, D.: The Gift of the Gab. How Eloquence Works. New Haven : Yale University Press 2016. Pravidlá slovenského pravopisu. 4., nezmenené vydanie. Red. M. Považaj. Bratislava : Veda 2013.
- KRÁĽ, Á.: Pravidlá slovenskej výslovnosti. 3. Vydanie. Bratislava : Matica slovenská 2016.
- Zákon o štátnom jazyku SR, dostupné na: http://www.culture.gov.sk/posobnost-ministerstva/statny-jazyk/zakon-o-statnom-jazyku-c2.html
- Štvrtá správa o stave používania štátneho jazyka na území Slovenskej republiky, 2018. [online] Dostupné na: file:///C: /Users/marek/AppData/Local/Temp/vlastnymat_na_internet-1.pdf
- Tretia správa o stave používania štátneho jazyka na území Slovenskej republiky, 2016. [online] Dostupné na: file:///C: /Users/marek/AppData/Local/Temp/3.Sprava_o_SJ-2016_aj_s_prilohami.pdf
- MIKUŠIAK, M.: Správa o stave jazykovej kultúry na Slovensku. In: Jazyková euromozaika – místo pro divergenci / konvergenci jazyků. Olomouc : Univerzita Palackého v Olomouci, 2018.
- ŠKVARENINOVÁ, O.: Rečová komunikácia. Slovenské pedagogické nakladateľstvo – Mladé letá, 2004. Časopisy Kultúra slova, Slovenská reč

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. PhDr. Juraj Hladký, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Fundamentals of Population Ecology
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Continuous Assessment:
Final assessment: standard subject completion – exam (graded scale)
Subject Completion:
Continuous assessment: active participation in seminars, seminar paper
Final assessment: written and oral exam
Form of completion: exam
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

- The student will acquire basic concepts and phenomena related to population and population ecology across all living organisms, including humans.
- They will be able to determine the basic characteristics and properties of populations, their structure, dynamics, and intra-population relationships, and understand the principles governing the functioning and development of populations.
- Special attention is paid to population genetics and its significance for adaptation to environmental changes.
- The student will be able to identify major issues at the population level and solve them.
- They will apply the acquired knowledge in further ecological and environmental sciences and in practice.

Brief Subject Outline:

- Definition and basic types of populations
- Population structure
- Population dynamics (principles and trends)
- Genetics and genetic structure of populations, genetic drift, and population adaptability
- Population ecology of bacteria and viruses, plants, animals, and humans
- Current issues of populations of organisms and humans

Literatúra:

- Trnka, A. 2020. Ekológia a environmentálna výchova 1. Pedagogická fakulta Trnavskej univerzity, Trnava.

- Townsend, C. R., Begon, M., Harper, J. L. 2010. Základy ekologie. Univerzita Palackého, Olomouc.
- Rockwood, L. L. 2015. Introduction to Population Ecology, 2nd Edition. Wiley-Blackwell
- Murray, D. L., Sandercock, B. K. 2020. Population Ecology in Practice, 1st Edition. Wiley-Blackwell.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Alfréd Trnka, PhD.

Date of last update: 25.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Communication of Environmental Topics
Type of educational activities: lecture; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

A minimum of 75% attendance at lectures and home preparation through studying the recommended literature is required to pass the subject.

Final assessment:

To complete the subject, students must pass a written test with a minimum score of 51%.

Completion method:

Written test

To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

After completing the subject, the student will be able to:

- Define and explain the basic concepts and principles of environmental communication.
- Identify and analyze barriers and challenges in communicating environmental issues.
- Propose appropriate communication strategies for various target groups in the field of environmental topics.
- Apply principles of effective communication when conveying environmental problems.
- Critically evaluate various forms and channels of environmental communication (media, social networks, campaigns).
- Create original communication outputs focused on environmental issues.
- Discuss ethical aspects of communication in the field of environmental protection.
- Evaluate the impact of communication on shaping public attitudes toward environmental issues.
- Present environmental topics in a clear, convincing manner tailored to the target audience.
- Reflect on and assess their own communication skills in the area of environmental topics.

Brief Subject Outline:

- Introduction to environmental communication
- Definition, importance, and objectives of environmental communication
- Key terms: environmental communication, public communication, media communication
- Fundamentals of effective communication
- Principles of successful communication
- Targeted communication and working with various target groups
- Specifics of communicating environmental issues
- Barriers and challenges in communicating environmental topics
- Influence of emotions, values, and attitudes on the reception of environmental topics
- Tools and channels of environmental communication
- Media, social networks, campaigns, community engagement
- Examples of successful communication strategies
- Rhetoric and argumentation in environmental topics
- Working with data, scientific knowledge, and its popularization
- How to clearly explain complex environmental topics
- Ethical aspects of environmental communication
- Manipulation, greenwashing, accuracy and truthfulness of information
- Practical training and simulations
- Creating communication outputs (poster, blog, video, presentation)
- Model situations: discussion, debate, public presentation

Recommended literature:

- Takahashi, B., Metag, J., Thaker, J., & Comfort, S. E. (Eds.). (2021). The handbook of international trends in environmental communication.
- Cox, R. (2013). *Environmental communication and the public sphere*. Sage.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: PaedDr. Ivan Ilʼko, PhD.

Date of last update: 24.5.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Environmental Ethics
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Ongoing assessment:

A prerequisite for passing the subject is 75% attendance at lectures and independent study of the recommended literature.

Final assessment:

To complete the subject, it is necessary to pass a written test with a minimum score of 51%.
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Completed: written test

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

After completing the subject, the student:

- Can explain basic concepts of environmental ethics, morality, and values, and distinguish between anthropocentric and non-anthropocentric approaches.
- Can identify and discuss alternative student attitudes toward environmental issues, as well as differing value-based approaches to nature.
- Can apply knowledge of ethical approaches to solving environmental issues (e.g., biodiversity protection, climate change, genetically modified organisms).
- Can discuss the significance and practical consequences of various ethical approaches (biocentrism, ecocentrism, theocentrism, anthropocentrism) on contemporary society and education.
- Can assess the possibilities of influencing attitudes toward nature and the environment through education, discussions, and ethical dilemmas.
- Can analyze factors influencing individual and societal environmental behavior, including cultural, religious, social, and political aspects.
- Can critically evaluate different approaches to environmental ethics (e.g., deep ecology, ecofeminism, environmental justice) and their application in practice.
- Can propose ethically grounded environmental activities and programs that consider the intrinsic value of nature and the principles of sustainable development.

- Can acquire knowledge on the didactic processing of environmental ethics topics and their application in education (linking environmental and ethical education).
- Can flexibly address ethical dilemmas and assigned tasks related to environmental issues (e.g., animal ethics, nature protection vs. development).
- Can implement and critically evaluate discussion-based, project-based, and experiential activities with environmental and ethical themes, including the application of philosophical concepts in practical education.
- Can plan, design, and reflect on teaching units that integrate scientific knowledge with ethical questions regarding the human-nature relationship.
- Can implement theoretical knowledge of values and ethical approaches in pedagogical practice, particularly in environmental and ethical education.
- Can present and defend their own views and solutions to ethical issues related to nature and environmental protection.
- Can acquire basic pedagogical skills for leading discussions and ethical reflections in environmental education and guide students toward a sensitive approach to nature.
- Can critically analyze factors influencing the quality of environmental and ethical education and propose innovations in didactic approaches.

Brief Subject Outline:

- **Introduction to Ethics and Environmental Ethics**
  - Basic concepts: ethics, morality, values
  - Types of morality and fundamental moral values
  - The nature of ethics as a science, the relationship between ethics and philosophy
  - Definition of environmental ethics, its position and significance
- **The Relationship Between Humans and Nature**
  - Historical development of the human–nature relationship
  - Models of human-nature interaction (hunter-gatherer, herder, farmer, producer, consumer)
  - Anthropocentrism, biocentrism, ecocentrism, theocentrism
- **Main Directions in Environmental Ethics**
  - Anthropocentric and non-anthropocentric ethics
  - Biocentrism, ecocentrism and their fundamental principles
  - Theocentrism and spiritual approaches to nature
- **Social and Political Movements Influencing Environmental Ethics**
  - Deep ecology, ecofeminism, social ecology
  - Environmental justice movement, animal rights movement, Fridays for Future
  - Critique of economic growth policies and proposed alternatives
- **Religions and Environmental Ethics**
  - Abrahamic religions (Christianity, Judaism, Islam) and their relationship to nature
  - Eastern religions (Confucianism, Taoism, Buddhism, Hinduism)
  - Animistic religions and spiritual views of nature
- **Current Challenges in Environmental Ethics**
  - Climate change, biodiversity loss, environmental pollution
  - Issues of genetic engineering
  - Responsibility to future generations and ethical questions of sustainability
- **Value Conflicts and Seeking Solutions**
  - Conflict between economic growth and nature conservation
  - Seeking a balance between human rights and the rights of nature
  - Philosophical and ethical approaches to sustainability and justice

Literature:

Henrich, G., 2022. Úvod do environmentálnej etiky. Univerzita Konštantína Filozofa v Nitre, 2022. ISBN 978-80-558-1862-7

Baďurová, B. (2015). Environmentálna etika a výchova. *B. Bystrica: Belianum*.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. RNDr. Vladimír Frišták, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 25.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Crisis Management, Mediation/ Association
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 3.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous Assessment: Seminar paper

Final Assessment: Written test

Mode of Completion:

During the semester, students prepare a seminar paper on a pre-assigned topic, worth 30 points. At the end of the semester, students take a written test worth 70 points. Students are required to obtain at least half of the points from each part.
To obtain a grade of A, a minimum of 92 points is required; for a grade of B, at least 83 points; for a grade of C, at least 74 points; for a grade of D, at least 65 points; and for a grade of E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

Students will acquire basic knowledge and skills necessary for effective crisis intervention. They will learn to identify the causes and manifestations of crisis situations, communicate effectively with clients in crisis, and implement appropriate intervention strategies to manage crisis situations.

Brief Subject Outline:

- Definition of key terms: crisis, crisis situation, mediation
- Psychology of crisis situations
- Approaches to crisis management
- Mediation as a tool for conflict resolution
- Legal and ethical aspects
- Practical skills (case simulations and mediation practice, communication and negotiation techniques, working with particularly demanding clients and conflicts)
- Mediation in family relationships
- Mediation in the workplace and organizations
- Mediation in school settings and the community

- Reflection on acquired competencies

Literature:

Michančová, S. – Dolanská, R. (Eds.) Súčasnosť a perspektívy probácie a mediácie. Prešov: Prešovská univerzita v Prešove, str. 18-39. ISBN 978-80-555-0162-8.
Pruţinská, J. - Szabová, M. - Labáth, V. 2006. Mediácia – príručka pre odbornú a laickú verejnosť. Bratislava: ARK. ISBN 80-969571-6-3.
Moore, C. W. (2014). *The Mediation Process: Practical Strategies for Resolving Conflict.* San Francisco: Jossey-Bass
Roberts, M. (2016). *Mediation in Family Disputes: Principles of Practice.* London: Routledge.
James, R. K., & Gilliland, B. E. (2017). *Crisis Intervention Strategies.* Boston: Cengage Learning.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Association of Mediation Centers of Slovakia

Date of last update: 30.6.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Methods of Ecological Research
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Continuous Assessment: Seminar paper from field research
Final Assessment: Written test
Mode of Completion:
During the semester, students prepare a seminar paper on a pre-assigned topic, worth 30 points. At the end of the semester, students take a written test worth 70 points. Students are required to obtain at least half of the points from each part.
To obtain a grade of A, a minimum of 92 points is required; for a grade of B, at least 83 points; for a grade of C, at least 74 points; for a grade of D, at least 65 points; and for a grade of E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon completion of the course, the student understands the objectives, significance, and basic principles of ecological field research, can characterize quantitative and qualitative methods of ecological data collection, is familiar with sampling methodology for plants, animals, soil, and water, understands the principles of monitoring abiotic environmental factors, is aware of the legislative and ethical aspects of field research, can design a simple ecological study (hypothesis, site selection, choice of methods), is able to practically apply field research methods, can work independently and in a team on field research tasks, and is capable of critically evaluating the quality, limitations, and practical applicability of collected data.

Brief Subject Outline:

- **Introduction to ecological research**
  - Objectives and significance of field research in ecology
  - Types of ecological studies (population, community, ecosystem)
- **Planning field research**
  - Formulating research questions and hypotheses
  - Selection of site and timeframe
  - Selection of appropriate data collection methods

- **Data collection methods in the field**
  - Quantitative and qualitative methods
  - Sampling of soil, water, plant, and animal material
  - Transects, quadrats, area and point methods
- **Methods of monitoring organisms**
  - Plant communities (phytosociological relevés, plant biometrics)
  - Animals (observation, trapping, marking, and recording techniques)
  - Indicator species and bioindication
- **Ecological instruments and techniques**
  - Measurement of abiotic factors (light, temperature, humidity, pH, nutrient content)
  - GPS, GIS, and remote sensing
  - Automatic sensors and modern monitoring technologies
- **Data processing and analysis**
  - Basic statistical procedures in ecological research
  - Interpretation of results and their limitations
- **Ethical and legislative aspects**
  - Research ethics in nature
  - Nature and species protection during field research
  - Permits and legal restrictions
- **Applications of field research**
  - Monitoring biodiversity and invasive species
  - Assessing human impacts on ecosystems
  - Inputs for nature conservation and environmental policy
- **Practical field exercises**
  - Training in specific field methods
  - Documentation and keeping of a field diary
  - Presentation and defense of results

Literature:

Dykyjová et al., 1989: Metody ekologického výskumu. Academia, Praha. 690 pp.
Krebs, C. J. (2014). *Ecology: The Experimental Analysis of Distribution and Abundance.* Harlow: Pearson.
Southwood, T. R. E., & Henderson, P. A. (2009). *Ecological Methods.* Oxford: Wiley-Blackwell.
Sutherland, W. J. (2006). *Ecological Census Techniques: A Handbook.* Cambridge: Cambridge University Press.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Alfréd Trnka, PhD., doc. Ing. Viera Peterková, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 30.6.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Fundamentals of Research Project Preparation
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous Assessment:

A 100% attendance at lectures and seminars is required, along with independent preparation through the study of recommended literature. During the seminars, each student will prepare an assigned task in the form of a project proposal on a selected environmental issue, which will be presented at the end of the semester. The project evaluation accounts for 50% of the total subject grade.

Final Assessment:

The subject is concluded with a written examination.

To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

Upon completion of the subject Fundamentals of Research Project Preparation, students will be able to:

- implement the principles of teamwork, basic project acquisition and project management,
- evaluate the feasibility of a project proposal in the context of human resources, material equipment, and risk management,
- address and interpret a given scientific problem based on experimental and theoretical knowledge,
- demonstrate team-acquired knowledge through a final project report,
- navigate national, transnational, and international grant schemes.

Brief Subject Outline:

- basics of scientific research project development and project management
- current national, transnational, and international project grant schemes
- project risk analysis
- project management and budget planning

- specification of research topics within proposed scientific projects in the selected research field
- project preparation – development of objectives, methodology, and planning of the experimental part
- design of the experimental part
- structure of monitoring and final reports
- forms of result presentation and concept of the final project report

Recommended literature:

- KRCHOVÁ. H. Praktický projektový manažment. Wolters Kluwer, 2019, 280 s. ISBN 978-80-7598-466-1.
- ROSENAU, M.D. Řízení projektu. Computer Press. 2010. 360 s. ISBN 978-80-2511-506-0.
- Specialized literature selected according to the proposed topic of the scientific project (scientific studies published in online databases).

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. RNDr. Martin Pipíška, PhD., doc. RNDr. Vladimír Frišták, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Toxicological Aspects in Environmental Components
Type of educational activities: lecture/seminar **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:

Continuous assessment:

The acquired knowledge and competencies of students will be evaluated during the semester through two interim tests and a semester presentation on an assigned topic. Only students who achieve at least 50% of the points from the interim tests and present their semester presentation will be admitted to the final examination.

Final assessment:

Form of completion: Oral examination

To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.

Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:

After completing the subject *Toxicological Aspects in Environmental Components*, the student will be able to:

- Define basic concepts in the field of substance toxicity and ecotoxicology.
- Identify principles of health protection when handling chemical substances and physical factors.
- Characterize sources of health hazards in everyday life and toxicological risks of substances in the work environment.
- Formulate and express their own standpoint on issues related to the toxicity of inorganic and organic pollutants in various environmental components.
- Apply knowledge and competencies in identifying sources of toxic substances and environmental contaminants, their effects on biological systems, and human health.
- Explain the relationship between the structure and toxicity of a substance.
- Apply knowledge about chemical substance interactions, genotoxicity, and the fate of substances in organisms.

Brief Subject Outline:

Lectures:

- Toxicology – Basic concepts and classification
- Poisons and their classification
- Toxicity assessment, exposure, and effects of toxic substances
- Factors influencing substance toxicity; relationship between structure, physicochemical properties, and toxicity
- Entry and distribution of toxic substances in the organism
- Mechanisms of transformation and elimination of toxic substances in the organism
- Toxicity of selected elements and compounds
- Pesticides, herbicides, and fungicides
- Toxicology of pharmaceuticals and natural compounds
- Micropollutants in the environment
- Environmental toxicology
- Legislative framework for handling toxic substances; new trends in reducing risks of chemical substances

Seminars:

- Basic relationships for toxicity assessment
- Implementation of simple ecotoxicological tests
- Preparation of toxicological profiles of selected xenobiotics
- Student presentations on assigned topics related to selected hazardous toxic substances

Recommended literature:

- FRIŠTÁK, V., FANČOVIČOVÁ, J. Toxikológia 1 – pre učiteľské kombinácie s chémiou. Pdf TU Trnava, 2019, 62 s. ISBN 978-80-568-0390-5.
- FRIŠTÁK, V., FANČOVIČOVÁ, J. Toxikológia 2 – pre učiteľské kombinácie s chémiou. Pdf TU Trnava, 2019, 50 s. ISBN 978-80-568-0391-2.
- MIKLOVIČ, J., HORNÍK, M. Vybrané kapitoly z toxikológie a ekotoxikológie. UCM Trnava, 2015, 232 s. ISBN 978-80-8105-740-3.
- PAVELEKOVÁ, I. Toxikológia a bezpečnosť práce v chemickom laboratóriu. Trnava : PdF TU, 2011. ISBN 978-80-8082-433-4 (elektronický titul)

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. RNDr. Miroslav Horník, PhD., doc. RNDr. Vladimír Frišták, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

University: *Trnava University in Trnava*

Faculty: *Faculty of Education*

Subject code:	**Subject Name:** Laboratory Practicum II

Type of educational activities: exercises; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 4
During the study period: summer
Method of educational activity: combined

Number of credits: *6*

Recommended semester of study: 6.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Ongoing assessment:
Regular attendance and submission of all laboratory reports.
During the semester, students take short written quizzes before each lab session (a minimum of 56% is required to pass each session).
For each session, students must submit a laboratory report (a minimum of 56% is required for the report to be accepted).
Final assessment:
Form of completion: Final written test
To obtain grade A, a minimum of 92 points is required; for grade B, at least 83 points; for grade C, at least 74 points; for grade D, at least 65 points; and for grade E, at least 56 points.
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon completing the subject "Laboratory Practicum II", the student will be able to:

- Classify and apply procedures for advanced analysis of environmental components.
- Characterize the physico-chemical principles of a given method.
- Handle more sophisticated measuring devices and analytical instruments.
- Use advanced synthetic and separation techniques.

Brief Subject Outline:

- Laboratory safety
- Sampling, processing, and pretreatment of environmental samples (homogenization, fractional analysis)
- Sampling, processing, and pretreatment of environmental samples (preconcentration)
- Sampling, processing, and pretreatment of environmental samples (microwave digestion)
- Principles and operation of advanced analytical instruments – Atomic Absorption Spectrometry
- Principles and operation of advanced analytical instruments – Flame Photometry

- Principles and operation of advanced analytical instruments – Infrared (IR) Spectrometry
- Principles and operation of advanced analytical instruments – Chronopotentiometry
- Principles and operation of advanced analytical instruments – High-Performance Liquid Chromatography (HPLC)
- Principles and operation of advanced radioanalytical instruments – Scintillation Gamma Spectrometry, Radiameter (GM Counter)
- Adsorption of food dye on solid-phase interface – Kinetic studies
- Adsorption of metal on solid-phase interface – Adsorption isotherms

Recommended literature:

- REGULI, J. Laboratórne cvičenia z fyzikálnej chémie. Trnava: PdF TU, 2009. ISBN 978-80-8082-271-2.
- MELICHERČÍK, M. a kol. Laboratórne cvičenia z fyzikálnej chémie. Banská Bystrica: UMB. 2011. 122 s. ISBN 978-80-5570-276-6.
- PIPÍŠKA, M., REMENÁROVÁ, L. Environmentálne biotechnológie – Biosorpcia toxických látok. Trnava : UCM. 2014, 176 s. ISBN 978-80-8105-
- 531-7.
- ILAVSKÝ, J. Chémia vody - laboratórne cvičenia. Bratislava: STU. 2015. 189 s. ISBN 978-80-2274-421-8.
- PAVELEKOVÁ, I.; ŽOLDOŠOVÁ, K.: Laboratórne cvičenia z analytickej chémie. Trnava : PdF TU, 2001. 79 s. ISBN 80-88774-94-2.
- VALICA, M., HORNÍK, M.: Laboratórne cvičenia z remediačných technológií. Fakulta prírodných vied UCM v Trnave, 2024, 150 s. ISBN 978-80-572-0463-3.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. RNDr. Miroslav Horník, PhD., doc. RNDr. Vladimír Frišták, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *Trnava University in Trnava*	
Faculty: *Faculty of Education*	
Subject code:	**Subject Name:** Professional Internship II
Type of educational activities: exercises; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 4 **During the study period:** summer **Method of educational activity: combined**	
Number of credits: *6*	
Recommended semester of study: 6.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subject:
Completion of internship and presentation of internship results
Overall subject evaluation:

- A (1.0) excellent – outstanding results with only minor errors (92–100%)
- B (1.5) very good – above-average results with some minor errors (83–91%)
- C (2.0) good – generally good, average performance (74–82%)
- D (2.5) satisfactory – acceptable results, but with significant errors (65–73%)
- E (3.0) sufficient – results meet minimum criteria (56–64%)
- FX (4.0) insufficient – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
After completing the subject, the student will be able to:

- Navigate the practical activities of organizations involved in assessing the impact of human activities on the environment.
- Gain experience in the application of environmental legislation in practice.
- Identify key environmental issues addressed by the organization in practice.
- Apply theoretical knowledge from environmental disciplines to solve specific tasks and projects.
- Collaborate on the preparation of expert documentation, analyses, and reports.
- Analyze and assess the impacts of human activity on the environment under expert supervision.
- Discuss ethical and legal aspects of environmental protection in a practical context.
- Present the results of their activities and reflect on the knowledge and experience gained.
- Acquire skills in administration, organization, and communication relevant to working in public administration, local government, or the non-profit sector.

Brief Subject Outline:

- **Introduction to the Internship** – Objectives and importance of professional practice in the field of environmental protection. Introduction to the organization's activities – assessment of the impacts of human activities on the environment, implementation of environmental legislation, and activities within the selected sector.
- **Participation in Routine Agenda and Projects of the Organization** – Practical collaboration on professional activities of the organization (analyses, preparation of documents, monitoring).
- **Observation and Assistance with Professional Tasks** – e.g., field measurements, report writing, preparation of documentation for legislative processes.

- **Reflection and Consultations with Mentor** – Ongoing evaluation of activities performed, feedback, and recommendations.
- **Final Evaluation of the Internship** – Preparation of a final report and presentation of internship outcomes.

Recommended literature:

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. Ing. Viera Peterková, PhD., PaedDr. Ivan Iľko, PhD.

Date of last update: 24.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Compulsory Subjects

1. Psychology of Childhood and Education
2. **Environmental Science**
3. Chemistry and Society
4. **Laboratory Practicum I**
5. Pedagogical Communication and School Evaluation
6. **Introduction to Ecosystem Sciences**
7. **Basics of Statistics**
8. **Research Project Internship**
9. Inclusion in Education
10. **Global Environmental Problems**
11. **Environmental Education in the School Environment**
12. School Policy and Administration
13. **Practical Solutions to Environmental Problems**
14. **Environmental Management**
15. Planning, Development and Implementation of Curriculum
16. **Environmental and Green Technologies**
17. **Sustainable Development**
18. **Bachelor's Thesis Defense**
19. **Renewable Energy Sources**
20. Environmental Policies and Law
21. **Professional Internship I**

Compulsory Elective Subjects

1. Teaching Profession and Professional Ethics
2. Biological Aspects of Pupil Development
3. Concept of Learning and Education
4. Problem Behaviour of Pupils
5. History of Institutional Education
6. Reading and Media Literacy
7. Academic Writing
8. Culture of Teacher's Speech and Cultural Literacy
9. **Geographic Information Systems**
10. **Remote Sensing of the Earth**
11. **Introduction to Radioecology**
12. **Security of Environmental Data and Information**
13. Fundamentals of Population Ecology
14. Communication of Environmental Topics
15. Environmental Ethics
16. Crisis Management, Mediation / Association
17. **Environmental Monitoring and Bioindicators**
18. **Methods of Ecological Research**
19. **Fundamentals of Research Project Preparation**
20. **Toxicological Aspects in Environmental Components**
21. **Laboratory Practicum II**
22. **Professional Internship II**

Profile subjects

Compulsory subjects

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Basics of Statistics

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 2.

Level of study: 1.

Prerequisite subjects:

Subject Completion Requirements:
Continuous assessment:
During the continuous assessment, a written test will be administered for 40 points.
Final assessment:
The exam will consist of a practical part where the student can earn 60 points. In total, the student can earn 100 points.
Method of completion:
The exam is conducted in oral form.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning Outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge of methods for collecting and processing data obtained through mass surveys or measurement of a specific characteristic;
- The ability and skill to analyze a statistical dataset, particularly univariate variables, using statistical methods suitable for studying technical and natural science processes;
- The ability to examine and analyze the influence of factors on given processes, express relationships between phenomena, verify assumptions, and estimate characteristics of the observed processes.

Brief Subject Outline:

1. Theory of probability, basic concepts, calculation of probabilities of simple events, analytical methods for calculating probabilities of complex events.
2. Random variable, distribution of random variables, ways of describing probabilistic behavior of random quantities. Description using quantitative characteristics: location, variability, skewness, kurtosis, moment characteristics.
3. Theoretical distribution models of univariate random variables, models of discrete variables (binomial, hypergeometric, Poisson distribution).
4. Models of continuous variable distributions (normal, Student's, Snedecor's distributions).

5. Sampling methods, nature of sampling, population, sample, distribution and properties of sample statistics.
6. Determination of population characteristics, point estimate, interval estimate, confidence interval for mean and variance, estimation in binomial distribution.
7. Determining sample size, for normally distributed populations and for binomial distribution.
8. Hypothesis testing – process, types of tests.
9. Testing means and variances, testing significance of differences between means, paired value tests.
10. Frequency testing – goodness-of-fit tests (parametric and non-parametric), tests of independence, tests for outliers.
11. Analysis of variance (ANOVA), types of problems, one-factor balanced design.
12. Correlation analysis – types of problems, regression and correlation tasks, simple linear correlation.

Recommended literature:

KUČEROVÁ, M., FIDLEROVÁ, H. 2012. Štatistické metódy. Trnava: AlumniPress, 192 s. ISBN978-80-8096-155-8.

JANIGA, I. 2013. Aplikovaná pravdepodobnosť a štatistika pre inžinierov : štatistická analýza jedného a dvoch súborov dát 1.diel. Bratislava: Nakladateľstvo STU, 265 s. ISBN 978-80-227-4046-3.

JANIGA, I., STAREKOVÁ, A. 2001. Základy pravdepodobnosti a štatistiky. Bratislava : STU v Bratislave, 201s.ISBN 80-227-1603-0.

CHAJDIAK, J. 2013. Štatistika jednoducho v Exceli. Bratislava: Statis, 344 s. ISBN 978-80-85659-74-0.

McCLAVE, J. T., DIETRICH F. H. 1998. Statistics. San Francisco : Dellen Publishing Company, 1014 s. ISBN 0-02-379260-4.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. RNDr. Iveta Dirgová Luptáková, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Global Environmental Problems

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 5
Weekly: 3/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *7*

Recommended semester of study: 3.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
Continuous Assessment:
Students are required to submit a written seminar paper, which accounts for **30%** of the total grade.
Final Assessment:
Students will take an **oral examination**, which accounts for **70%** of the total grade.
Method of Completion:
Completion by **oral examination**.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge of a culturally diverse and globally interconnected world
- The ability and competence to collect and sort information on global issues
- The ability to express their own position on environmental issues
- The competence to present proposals for solving global problems

Brief outline of the subject:

1. Definition of basic concepts in the subject area, biosphere, human environment (natural, work), organization of environmental care in the Slovak Republic
2. Nature, causes, and impacts of global environmental problems on life on Earth
3. Air pollution
4. Climate change (greenhouse effect)
5. Depletion of the ozone layer (ozone hole)
6. Acidification (acid rain), smog
7. Water pollution
8. Soil pollution and erosion
9. Threats to biological diversity (biodiversity)
10. Human population growth, increasing resource consumption
11. Waste production

12. Environmental risk assessment and management

Recommended literature:

BAUMAN, Z. 2000. Globalizácia: dôsledky pre ľudstvo. Bratislava : Kalligram. ISBN 80-7149-335-X.

PETROVIČ, F. (ed) 2011. Environmentálne hľadiská trvalo udržateľného rozvoja Zeme. Nitra : UKF. ISBN 978-80-558-0021-9.

MOLDAN, B. 2009. Podmaněná planeta. Praha : Karolinum. ISBN 978-80-2461-580.

HARRIS, F. 2004. Global environmental issues. West Sussex, England : John Wiley & Sons, 324 s. ISBN 0-470-84560-0.

JOHNSTON, B. R. (ed) 2012. Water, cultural diversity, and global environmental change. Springer, 560 s. ISBN 978-94-007-1866-1.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: doc. RNDr. Miroslav Horník, PhD.; RNDr. Monika Šutáková, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Environmental Management

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *7*

Recommended semester of study: 4.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subject:
Continuous Assessment:
Students are required to submit a written seminar paper, which accounts for **30%** of the total grade.
Final Assessment:
Students will take an **oral examination**, which accounts for **70%** of the total grade.
Method of Completion:
Completion by **oral examination**.
Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will gain:

- The ability and competencies to solve and manage environmental problems at the level of enterprises, public and state administration, in accordance with the requirements of the **STN EN ISO 14001** standard structure, as a modern tool in organizational management;
- Knowledge of necessary modern environmental protection tools, including: environmental management systems, environmental audits, quality management systems (QMS), and impact assessments of activities, constructions, and facilities on the environment.

Brief outline of the subject:

1. Sustainable development and global issues
2. Documents for addressing environmental problems
3. Preventive strategies as part of an organization's environmental policy
4. System management methods leading to proactive environmental action
5. Importance of implementing QMS
6. Total Quality Management (TQM), clean production, excellence model, Responsible Care program
7. Environmental management
8. Environmental management systems

9. Structure of the STN EN ISO 14001 standard, EMAS
10. Environmental audit
11. Environmental impact assessment
12. Evaluation of environmental behavior, environmental reporting

Recommended literature:

VIRČÍKOVÁ, E., PALFY, P. 2001. Environmentálne manažérstvo – teória a prax. Košice : Vydavateľstvo Štroffek.

ENGEL, J. (ed) 2006. Technicko-ekonomické aspekty environmentálneho manažérstva. Košice : F BERG TU.

HUNT, D., JOHNSON, C. 1995. Environmental management systems: Principles and Practice. UK : McGraw-Hill.

STARKEY, R. 1997. Environmental management tools for SMEs – A handbook. USA : Environmental Agency.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: RNDr. . Vanda Adamcová, PhD.; Ing. Sabína Královičová

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Sustainable Development

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *6*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
Continuous Assessment:
During the semester, students will prepare a semester presentation on a selected topic in the context of sustainable development.
Final Assessment:
Not explicitly stated, but implied as part of overall assessment.
Method of Completion:
The exam is conducted in **written and oral form.**

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will gain:

- Knowledge and overview of global issues affecting humanity and an understanding of the need to preserve sustainable development (life) on our planet;
- Knowledge and overview of political activities of the state in addressing economic, social, and environmental problems, and the ability to analyze the changing nature of global security and manifestations of crisis;
- The opportunity to become an active participant in the search for, formulation, and implementation of tools aimed at achieving sustainable quality of life and changes in the behavior of human society.

Brief outline of the subject:

1. Basic characteristics and pillars of sustainable development. History of inequality and characteristics of global problems of humanity.
2. Dimensions of population growth.
3. Poverty and food security issues.
4. Public health conditions.
5. The changing nature of global security in the 21st century.
6. Environmental assessment and product labeling in the EU.

7. Principles of applying sustainable development in major economic sectors.
8. Principles of applying sustainable development in the non-productive sphere: education, upbringing, economic system, tourism, human settlements, value orientation, and nutrition.
9. Methods of promoting principles and criteria of sustainable development.
10. Explanation of globalization, social and environmental problems of the current stage of globalization.
11. Sustainable development from the perspective of environmental impact assessments and environmental burdens.
12. Millennium Development Goals, Sustainable Development Agenda, and EU and Slovak strategies in the context of sustainable development.

Recommended literature:

DEMO, M. (ed) 2007. Udržateľný rozvoj – život v medziach únosnej kapacity biosféry. Nitra : VES SPU. ISBN 978-80-8069826-3.

KLINDA, J. 2001. Agenda 21 a trvalo udržateľný rozvoj. Bratislava : MŽP SR. ISBN 80-88833-03-5.

PINDERHUGHES, R. 2004. Alternative urban futures: Planning for sustainable development in cities throughout the world. Rowman and Littlefield Pub. ISBN 978-07-4252-367-8.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: prof. Mgr. Ildikó Matušíková, PhD.; RNDr. Monika Šutáková, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code: | **Subject Name:** Renewable Energy Sources

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 6.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
Continuous Assessment:
Students' acquired knowledge and competencies will be verified during the semester through **2 continuous tests**. Only students who achieve at least **56% success** in each test will be admitted to the final examination.
Final Assessment:
(not explicitly described separately, part of overall assessment)
Method of Completion:
Completion by **oral examination**.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge and competencies in the use of **renewable energy sources (RES)**: hydropower, wind energy, direct solar energy utilization, biomass, and geothermal energy.
- Knowledge about the **technical equipment** used for RES, as well as the **economic, legal, and safety aspects**, and **environmental impacts** of their use.

Brief outline of the subject:

1. Non-renewable and renewable natural resources – characteristics and overview. Environmental impacts of energy production, environmental impact assessment.
2. Renewable energy as energy sources, global energy challenges, energy policy in the Slovak Republic and the EU. Potential of RES use in Slovakia.
3. Conventional energy production – fossil fuels. Main advantages and disadvantages of traditional fuel use. Current sources and potential replacements.
4. Conventional energy production – nuclear fuels. Energy generation through nuclear fission. Overview of nuclear power plant and reactor technologies. Main pros and cons.
5. Solar energy – origin in thermonuclear fusion. Active and passive solar energy utilization. Photovoltaic systems. Solar collectors.

6. Use of wind energy – overview of key terms and technologies. Wind turbine technology.
7. Use of hydropower – overview of terms. Classification of hydroelectric plants. Water turbine technologies. Use of ocean and sea hydropower.
8. Origin and use of geothermal energy – technology overview, benefits and limitations.
9. Heat pumps.
10. Biomass – energy crops and organic waste.
11. Production and use of liquid and gaseous biofuels (ethanol, methanol, MERO, biogas). Pros and cons of biomass utilization.
12. Possibilities of energy savings. Advanced and alternative methods of energy harvesting and storage.

Recommended literature:

POLÁK, M. (ed) 2013. Bezlopatková miniturbína: cesta k energetickému využití nejmenších vodních zdrojů. Praha : České vysoké učení technické, 168 s. ISBN 978-80-01-05233-4.
MURTINGER, K. (ed) 2009. Fotovoltaika. Brno : Vydavateľstvo ERA Brno, 81 s. ISBN978-80-7366-133-5.
BOLEMAN, T., FIALA, J. 2009. Obnoviteľné zdroje energie. Trnava : MTF v Trnave, 72 s. ISBN978-80-89422-07-4.
PASTOREK, Z. (ed) 2004. Biomasa, obnoviteľný zdroj energie. Praha : FCCC PUBLIC s.r.o., 286 s. ISBN 80-86534-06-5.
TWIDELL, J., Weir, T. 2006. Renewable energy resources. New York : Taylor & Francis, 601 s. ISBN 0-419-25320-3.
VIEIRADA, R, A. 2005. Fundamentals of renewable energy processes. New York : Elsevier Academic Press, 689 s. ISBN 978-0-12-088510-7.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Martin Valica, PhD.; doc. RNDr. Miroslav Horník, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Compulsory elective subjects

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Geographic Information Systems

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
The student's evaluation consists of a practical component — the completion of a project assigned at the beginning of the semester. The student must obtain at least **56% of the total points**.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge in the field of Geographic Information Systems (GIS);
- Understanding of fundamental concepts in this field;
- The ability to apply the acquired knowledge during project development, e.g., creating shapefiles for various purposes, generating attribute tables, etc.;
- Skills in evaluating and interpreting acquired data.

Brief outline of the subject:

1. Issues in Geographic Information Systems
2. Basic concepts related to the use of open-source and proprietary applications
3. Types of geographic data and their characteristics
4. Data models
5. Types of spatial data
6. Classification and characteristics of spatial relationships in 2D and 3D topological structures
7. Work and imaging techniques using unmanned aerial vehicles (drones)
8. Creation of map outputs
9. Working with layers
10. Data presentation
11. Theoretical and practical knowledge and skills in evaluating and interpreting obtained data
12. • Presentation and defense of completed projects

Recommended literature:

HOFIERKA, J. (ed) 2014. Geoinformatika. Košice : Prírodovedecká fakulta UPJŠ.
ĎURIŠ, J. (ed) 2003. Geodézia. 1. vyd. Nitra : Slovenská poľnohospodárska univerzita, 310 s. ISBN 80-8069-290-4.
IŠTOK, R. (ed) 1999. Geografia verejnej správy. ISBN 80-88885-65-5.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Marián Hosťovecký, PhD.; Mgr. Juraj Kubeš

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code: | **Subject Name:** Remote Sensing of the Earth

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
The student's grade is composed of a **practical part** – the development of a semester project, either in a team or individually, based on topics offered by the instructor or agreed upon with the student(s) (**50% of the total grade**), and a **theoretical part** – a written test (**50% of the total grade**).
The student must obtain at least **60% of the points** in each part to pass.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge of how satellite systems, aerial imaging, and drone imaging work
- Practical knowledge and skills from exercises using unmanned aerial vehicles (drones)
- Knowledge and skills in photo interpretation of aerial images
- Skills in analyzing images of the Earth's surface
- Specific knowledge and competencies based on lectures and exercises across various geographic disciplines such as climatology, pedology, phytogeography, biogeography, hydrology, environmental science, and others

Brief outline of the subject:

1. Introduction to the course
2. Satellite, aerial, and unmanned systems used in remote sensing
3. Types of digital information / photometry
4. Photography, multispectral and hyperspectral satellite images
5. Laser images and others
6. Principles of imaging at the satellite system level
7. Principles of imaging using aircraft and UAVs
8. Principles of triangulation
9. Hardware and software solutions in the field of remote sensing
10. Possibilities of using these systems for mapping and measuring objects in selected geographic and landscape resource sectors

11. Analysis of Earth surface imagery related to environmental quality monitoring
12. Presentation of semester projects

Recommended literature:

CANADIAN CENTRE FOR REMOTE SENSING. 2012. Fundamentals of RemosteSensing (učebný text v angličtine, in English), 256 s. URL: http://www.nrcan.gc.ca/earth-sciences/geography-boundary/ remote-sensing/fundamentals/1430.
GALLAY, M. Diaľkový prieskum Zeme. Prírodovedecká fakulta UPJŠ.
LILLESAND, K. 2008. Remote Sensing and Image Interpretation. NY: Wiley, 756 s.
JENSEN, K. 2005. Introductory Digital Image Processing. Prentice Hall, 526 s.
HOFIERKA, J. (ed) 2014. Geoinformatika. Košice : Prírodovedecká fakulta UPJŠ.
ŽIHLAVNÍK, S., SCHEER, L. 2001. Diaľkový prieskum Zeme v lesníctve. Zvolen.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Marián Hosťovecký, PhD.; Mgr. Juraj Kubeš

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Introduction to Radioecology

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
Continuous Assessment:
Students are required to submit a written seminar paper, which accounts for **30% of the final grade**.
Final Assessment:
Students will take an **oral exam**, which accounts for **70% of the final grade**.
Method of Completion:
Completion by **oral examination**.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will acquire:

- Knowledge of general principles in nuclear sciences, including the detection of radioactivity
- Basic knowledge of the operation of nuclear energy technologies
- Understanding and competencies in the sources of contamination in the atmosphere, hydrosphere, and pedosphere caused by ionizing radiation, as well as the behavior of radionuclides in environmental components
- Competence and some practical skills in determining and monitoring natural radioactivity and natural radionuclides

Brief outline of the subject:

1. Nature of radioactivity. γ decay, metastable state and isomeric transition, internal conversion, β^- and β^+ decay, electron capture, α decay, spontaneous fission, nucleon emission, decay schemes
2. Natural and artificial radioactivity. Radioactive decay series
3. Kinetics of radioactive decay
4. Secular and transient radioactive equilibrium, basics of isotope chronology
5. Interaction of ionizing radiation with matter
6. Physical, biological, and effective half-life

7. Classification of radionuclides by radiotoxicity
8. Detection of radioactive radiation: ionization methods, scintillation methods, radiography
9. Stages in the development of radioecology and its place in the system of natural sciences
10. Anthropogenic environmental radioactivity: nuclear testing and nuclear power plants
11. Sources of contamination of the atmosphere, hydrosphere, and pedosphere by ionizing radiation
12. Pathways of radionuclide transfer from source to humans

Recommended literature:

MÁTEL, Ľ., DULANSKÁ, S. 2013. Základy jadrovej chémie. Bratislava : Vydavateľstvo UK, 219 s. ISBN 978-80-223-3365-8.

TÖLGYESSY, J., HARANGOZÓ, M. 2000. Rádioekológia. Zvolen : Bratia Sabovci, 131 s. ISBN 80-8055-346-7.

ATWOOD, D. 2010. Radionuclides in the environment. New York : Wiley, 522 s. ISBN 978-0-470-71434-8.

CHOPPIN, G. (ed) 2013. Radiochemistry and nuclear chemistry. 4th Edition. New York : Elsevier, Academic Press. 866 s. ISBN 978-0-12-405897-2.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: RNDr. Vanda Adamcová, PhD.; doc. RNDr. Miroslav Horník, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*

Faculty: *Faculty of Natural Sciences*

Subject code:	**Subject Name:** Security of Environmental Data and Information

Type of educational activities: lecture/seminar; *profile subject*
Scope of educational activities (in hours): 4
Weekly: 2/2
During the study period: winter
Method of educational activity: in-person

Number of credits: *5*

Recommended semester of study: 5.

Level of study: 1.

Prerequisite subjects:

Requirements for completing the subjects:
Continuous assessment:
Throughout the semester, students will present the results of their individual study each week during seminars.
Final assessment:
Students will take a final written exam during the examination period.
Form of completion:
The course is completed by a written examination.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:
Upon successful completion of the course, the student will be able to:

- Understand the principles of protecting sensitive environmental data and information;
- Comprehend the legal and ethical aspects of processing environmental data;
- Demonstrate knowledge of modern technologies for ensuring data integrity and confidentiality;
- Design and apply strategies for managing access to sensitive data;
- Identify and minimize risks of information leakage in environmental research;
- Critically assess security risks associated with environmental data;
- Propose comprehensive solutions for the protection of environmental information systems;
- Communicate security aspects of environmental data effectively to various stakeholders.

Brief outline of the subject:

1. Introduction to environmental data and information security
2. Legal and regulatory frameworks for data protection in the environmental context (GDPR, environmental laws)

3. Identification and classification of sensitive environmental data
4. Principles and implementation of Zero Trust architecture in environmental information systems
5. Cryptographic methods and their application in environmental data protection
6. Access and identity management in the context of environmental data
7. Security of cloud solutions for storing and processing environmental information
8. Data protection in IoT devices used in environmental monitoring
9. Data leakage detection and prevention in environmental research
10. Ethical aspects and data minimization in environmental research
11. Security audits and risk assessment in environmental information systems
12. Incident response and recovery plans for environmental data systems. Emerging trends in environmental data and information protection.

Recommended literature:

KOLOUCH, J. 2019. *CyberSecurity*, CZ.NIC, z.s.p.o. 2019. https://web2.mlp.cz/koweb/00/04/49/72/14/cybersecurity.pdf

LAYODE, O., NAIHO, H. N. N., ADELEKE, G. S., UDEH, E. O., LABAKE, T. T. 2024. Data privacy and security challenges in environmental research: Approaches to safeguarding sensitive information. *International Journal of Applied Research in Social Sciences*, *6*(6), 1193-1214.

SULICH, A., RUTKOWSKA, M., KRAWCZYK-JEZIERSKA, A., JEZIERSKI, J., ZEMA, T. 2021. Cybersecurity and sustainable development. *Procedia Computer Science*, *192*, 20-28.

HURAJ, L., ŠIMON, M. 2019. Cloudové a gridové technológie: princípy a bezpečnosť. 1. vyd., Banská Bystrica: Belianum. 2019, 153 s. ISBN: 978-80-557-1660-2.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Ing. Peter Střelec, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.

Subject information list

University: *University of SS. Cyril and Methodius in Trnava*	
Faculty: *Faculty of Natural Sciences*	
Subject code:	**Subject Name:** Environmental Monitoring and Bioindicators
Type of educational activities: lecture/seminar; *profile subject* **Scope of educational activities (in hours):** 4 **Weekly:** 2/2 **During the study period:** winter **Method of educational activity:** in-person	
Number of credits: *6*	
Recommended semester of study: 4.	
Level of study: 1.	
Prerequisite subjects:	

Requirements for completing the subjects:

Continuous Assessment:

A prerequisite for completing the course is active participation in classes in accordance with the Study Regulations of UCM in Trnava. Preparation of a semester paper on current topics in the field of environmental monitoring and bioindicators (20% of the total grade).

Final Assessment:

Students will undergo an oral exam (80% of the total grade).

Method of Completion:

Completion through an oral exam.

Overall subject evaluation:

- **A (1.0) excellent** – outstanding results with only minor errors (92–100%)
- **B (1.5) very good** – above-average results with some minor errors (83–91%)
- **C (2.0) good** – generally good, average performance (74–82%)
- **D (2.5) satisfactory** – acceptable results, but with significant errors (65–73%)
- **E (3.0) sufficient** – results meet minimum criteria (56–64%)
- **FX (4.0) insufficient** – completion of the subject requires significant additional effort and work from the student (0–55%)

Learning outcomes:

Upon successful completion of the course, the student will acquire:

- the ability to comprehensively understand the principles of environmental monitoring and the importance of bioindicators in assessing the state of the environment;
- skills to apply various methodologies for data collection and evaluation in environmental monitoring, with an emphasis on their use in scientific research activities;
- skills in assessing water, soil, and air quality, biodiversity status, and the condition of selected ecosystems using bioindicators;
- the ability to apply acquired knowledge and skills in practice, for example in monitoring and evaluating the state of the environment, in the preparation of environmental reports and studies, as well as in designing and implementing nature protection measures.

Brief outline of the subject:

1. Principles of environmental monitoring, definitions of basic concepts, and the importance of bioindicators.
2. Factors affecting the distribution, abundance, and species interactions of organisms.

3. Types of bioindicators and selection of appropriate bioindicators.
4. Use of endemism and surrogate species (“keystone, flagship, and umbrella” species).
5. Monitoring and bioindication – microorganisms.
6. Monitoring and bioindication – flora I.
7. Monitoring and bioindication – flora II.
8. Monitoring and bioindication – fauna I.
9. Monitoring and bioindication – fauna II.
10. Pollution and toxicity monitoring.
11. Assessment of water, soil, and air quality.
12. Biodiversity assessment, evaluation of the status of selected ecosystems using bioindicators.

Recommended literature:

KALISIŃSKA, E.: Mammals and Birds as Bioindicators of Trace Element Contaminations in Terrestrial Environments, Springer, 2019.
OROLÍNOVÁ, M.: Chémia a životné prostredie, Trnavská univerzita v Trnave, 2009.
BOHÁČ, J.: Ochrana biodiverzity, Jihočeská univerzita v Českých Budějovicích, 2013.

Language required for subject completion: english

Notes:

Subject Evaluation:

Total number of evaluated students:

A	B	C	D	E	FX

Teachers: Mgr. Richard Hančinský, PhD.; doc. RNDr. Miroslav Horník, PhD.

Date of last update: 28.3.2025

Approved by: prof. RNDr. Alfréd Trnka, PhD.