CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/PVS/04	**Course name:** Author's patents, discoveries, software
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Patent filed, invention, software product created.	
Learning outcomes: The PhD student demonstrates the ability to create an innovative product in a given scientific field, or with impact on an interdisciplinary scale or in technical practice.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 48	

abs	n
100.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/COK/22	**Course name:** Certified training course

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of a certified professional/training course.

Learning outcomes:
The PhD student acquires up-to-date scientific knowledge, develops the capabilities of scientific work and familiarizes himself with the methodologies of making scientific knowledge available. He confronts his own knowledge and skills with other course participants, develops the abilities of peer discussion in the given scientific field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 7

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SPAV/22	**Course name:** Co-investigator of the applied research project

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Co-investigator of the applied research project

Learning outcomes:
The PhD student demonstrates the ability to participate in teamwork, to bring his own contribution to the solution of the project objective of applied research and to take responsibility for assigned tasks. By solving an applied research project, he acquires the ability to implement the project objective according to the established procedure, to follow the project schedule, to coordinate his own activities with colleagues, to participate in the creation of applied research outputs. The PhD student gains valuable experience from the practical course of a grant project with a focus on applied research.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 16

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SIG/22	**Course name:** Co-worker of project supported by internal grant schemes (VVGS)

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 3

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Co-worker of project supported by internal grant schemes (VVGS)

Learning outcomes:
The PhD student demonstrates the ability to participate in teamwork, to bring his own contribution to the solution of the project objective within the internal grant system at UPJŠ. By solving the internal VVGS grant, he acquires the ability to implement the project plan according to the established procedure, adhere to the project schedule, coordinate his own activities with colleagues, and participate in the creation of outputs. The PhD student gains valuable experience from the practical course of the grant project.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 16

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ SMPR/04	**Course name:** Co-worker of project supported by international grant schemes
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 15	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Membership in the research team of an international project.	
Learning outcomes: Active involvement by solving a specific task within a team of international project solvers. The PhD student demonstrates the ability to work in a team, take responsibility for the assigned task, adhere to the time schedule and fulfill the project outputs. The PhD student gains personal experience from the implementation of an international project, participation in its key stages, creation of measurable outputs, grant funding of science	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 131	

abs	n
100.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SDPR/22	**Course name:** Co-worker of project supported by national grant schemes

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Co-investigator of the domestic project

Learning outcomes:
The PhD student demonstrates the ability to participate in teamwork, to bring his own contribution to the solution of the project objective and to take responsibility for the assigned tasks. By solving the domestic project, he acquires the ability to implement the project intention according to the established procedure, to follow the project schedule, to coordinate his own activities with colleagues, to participate in the creation of outputs. The PhD student gains valuable experience from the practical course of the grant project.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 51

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DPPL/22	**Course name:** Computer-Based Physical Laboratory

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Terms and conditions of assessment during the semester
-participation in classes in accordance with study regulations and teacher´s instructions
-active participation at exercises
-submitting all the partial assignments in accordance with teacher´s instruction
Final assessment:
-final oral examination (aimed at presentation of the final assignment)
Conditions for successful completion of the course:
-participation in lessons in accordance with the study regulations and teacher's instructions
-achieving the level higher than 50 % in assessment during the semester (30points) and in final assessment (70points)

Learning outcomes:
By the end of the course students get an overview of the inquiry-based education methods enhanced by digital technologies used in experimentation supported by datalogging in particular (computer-aided experiment, videomeasurements of physical phenomena) and mathematical modelling of physical phenomena). Students gain skills and competencies to the effective use of these technologies with understanding of the appropriate methods aimed at scientific inquiry with active students´ participation. Students demonstrate the gained skills by designing their own activities enhanced by digital technologies for physics teaching at lower and upper secondary level.

Brief outline of the course:
1. Scientific inquiry in education in physics, activities aimed at inquiry
2. Computer modelling of physical phenomena (dynamic, static, different schools systems available for this purpose)
3. Simulations in teaching and learning.
4. Computer-aided experiment and its effective use in the class (methods, demonstrations, in groups, labworks, school systems available for this purpose)
5. Mobile technologies for data collection.
6. Videomeasurments of physical phenomena on the computer and its implementation into the teaching (how to prepare a videoclip, standard and high speed videoclip, school systems available for this purpose)

7.Comparing theory and experiment (model and data from experiment or videomeasurement), model simulated for different parameters in order to get good correspondence theory vs. experiment
8.Effective implementation of inquiry activities enhanced by digital technologies into education.
9.Assessment methods in inquiry-based education enhanced by digital technologies.
10.Students independent work on the activities aimed at different levels of inquiry enhanced by digital technologies and assessment tools.

Recommended literature:

Learning by doing the CMA way, dostupné na https://cma-science.nl/
THORNTON, David, Ronald, SOKOLOFF, David: Interactive lecture demonstrations, John Wiley and Sons, 2004

Course language:

English

Notes:

Course assessment

Total number of assessed students: 2

N	P
0.0	100.0

Provides: doc. RNDr. Zuzana Ješková, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ODZP/14	**Course name:** Defence of Doctoral Thesis

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
The Dissertation thesis is the result of the student's own scientific research. It must not show elements of academic fraud and must meet the criteria of correct research practice defined in the Rector's Decision no. 21/2021, which lays down the rules for assessing plagiarism at Pavel Jozef Šafárik University in Košice and its constituents. Fulfillment of the criteria is verified mainly in the process of supervising and in the process of the thesis defense. Failure to do so is grounds for disciplinary action.

Learning outcomes:
The Dissertation thesis has elements of a scientific work and the student demonstrates extensive mastery of the theory and professional terminology of the field of study, acquisition of knowledge, skills and competences in accordance with the declared profile of the graduate of the field of study, as well as the ability to apply them in an original way in solving selected problems of the field of study. The student demonstrates the ability of independent scientific work in terms of content, formal and ethical aspects. Further details of the Dissertation thesis are determined by Directive no. 1/2011 on the essential prerequisites of final theses and by the Study Rules of Procedure at UPJŠ in Košice for doctoral studies.
The doctoral student demonstrated the ability and readiness for independent scientific and creative activity in the field of study of philology in accordance with the expectations of the relevant qualification framework and the profile of the graduate.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 135

N	P
0.74	99.26

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DPEM/22	**Course name:** Development of Pedagogical Materials

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
student prepares five proposals of basic types of pedagogical materials
oral examination

Learning outcomes:
The main objective is to prepare students to gain skills and competencies in order to be able to create basic types of pedagogical materials, scientific publication and conference contribution.

Brief outline of the course:
Journals aimed at education, types of publications, different journal columns, guidelines for authors, paper review
Searching references, citations, electronic databases
Conferences aimed at education, conference goals, thematic areas, forms of papers, proceedings, electronic/ printed proceedings. Presentation at the conference, oral presentation. Paper abstract, key words, oral presentation and poster, contribution to the proceedings, reviewed journal paper (Slovak or international journal), case study.
The main idea of the paper, different approaches, design of the paper structure, further editing, references, stylistics, content, editing of graphs, pictures, tables, electronical documents.
Design and principles of the teacher´s materials, worksheets and educational texts.

Recommended literature:
KATUŠČÁK, Dušan: Ako písať záverečné a kvalifikačné práce. Nitra: Enigma, 2004. 162 s. il. ISBN 80-89132-10-3

Course language:
Slovak,, English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Marián Kireš, PhD., doc. PaedDr. Renáta Orosová, PhD.
Date of last modification: 17.02.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ VPZP/22	**Course name:** Elaboration of reviewer report
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Elaboration of reviewer report	
Learning outcomes: The PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly recommend another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: CJP/ AJD1/07	**Course name:** English Language for PhD Students 1

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of e-course English for PhD Students (lms.upjs.sk), consultations (1-3).
Written assignments - Professional/Academic CV, Short Academic Biography.

Learning outcomes:
The development of students´ language skills - reading, writing, listening, speaking; improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects; development of pragmatic competence - students acquire skills for effective and purposeful communication, with focus on Academic English and English for specific/professional purposes, level B2.

Brief outline of the course:
Specific aspects of academic and professional English with focus on correct pronunciation, vocabulary development (noun and verb collocations, phrasal verbs, prepositional phrases, word-formation, formal/informal language, etc.), selected aspects of English grammar (prepositions, grammar tenses, passive voice, etc.), academic writing (professional/academic CV, Short Academic Biography).

Recommended literature:
Moore, J.: Oxford Academic Vocabulary Practice. OUP, 2017.
Kolaříková, Z., Petruňová, H., Timková, R.: Angličtina v akademickom prostredí – cvičebnica. Košice, Vydavateľstvo ŠafárikPress, 2021.
Tomaščíková, S., Rozenfeld, J. Developing Academic English in Speaking and Writing. Vydavateľstvo ŠafárikPress, 2021.
McCarthy, M., O´Dell, F.: Academic Vocabulary in Use. CUP, 2008.
Štepánek, L., J. De Haff a kol.: Academic English-Akademická angličtina. Grada Publishing, a.s., 2011.
Armer, T.: Cambridge English for Scientists. CUP, 2011.
lms.upjs.sk

Course language:
English, level B2 according to CEFR

Notes:

Course assessment
Total number of assessed students: 813

N	Ne	P	Pr	abs	neabs
0.0	0.0	43.79	0.0	56.09	0.12

Provides: Mgr. Zuzana Kolaříková, PhD., Mgr. Ivana Kupková, PhD.

Date of last modification: 06.09.2024

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: CJP/ AJD2/07	**Course name:** English Language for PhD Students 2
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** distance, present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course: 4.	
Course level: III.	
Prerequisities:	
Conditions for course completion: Test, oral exam in accordance with the exam requirements (available at the web-site of the LTC and in MS TEAMS)	
Learning outcomes: The development of students´ language skills - reading, writing, listening, speaking, improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects, development of pragmatic competence - students can efectively use the language for a given purpose, with focus on Academic English and English for specific/professional purposes, level B2.	
Brief outline of the course: Academic communication (self-presentation, presenting at scientific meetings and conferences). Specific aspects of academic and professional English with focus on vocabulary development (formality, academic word-list), English grammar (passive voice, nominalisatio), language functions (expressing opinion, cause/effect, presenting arguments, giving examples, describing graphs/charts/schemes, etc.). Cross-language interference.	
Recommended literature: Moore, J.: Oxford Academic Vocabulary Practice. OUP, 2017. Kolaříková, Z., Petruňová, H., Timková, R.: Angličtina v akademickom prostredí (cvičebnica). UPJŠ Košice, 2021. Tomaščíková, S., Rozenfeld, J. Developing Academic English in Speaking and Writing. Vydavateľstvo ŠafárikPress, 2021. McCarthy, M., O´Dell, F.: Academic Vocabulary in Use. CUP, 2008. Štepánek, L., J. De Haff a kol.: Academic English-Akademická angličtina. Grada Publishing, a.s., 2011. Armer, T.: Cambridge English for Scientists. CUP, 2011.	
Course language: B2 level according to CEFR	
Notes:	

Course assessment
Total number of assessed students: 776

N	Ne	P	Pr	abs	neabs
0.26	0.0	94.07	1.03	4.51	0.13

Provides: Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 03.02.2025

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/DKZU/22	**Course name:** Home Conference with Foreign Participation

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in a national conference with foreign participation.

Learning outcomes:
By actively participating in a scientific conference, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology in his scientific field. He demonstrates the ability to reflect on a specific scientific problem by using the latest approaches and applying them critically. Demonstrates competence to use existing theories and concepts in an innovative way, as well as generate new original scientific knowledge and communicate research results to a wider audience by adequate means and through Slovak or a foreign language.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 69

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ NEM/04	**Course name:** Implementation of new experimental methodology
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 15	
Recommended semester/trimester of the course: 8.	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 100	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ZC/22	**Course name:** International Journal

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a foreign journal as an author/co-author.

Learning outcomes:
By publishing in a foreign journal as an author/co-author, the PhD student demonstrates a high level of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 4

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ZSP1/22	**Course name:** International Study Stay less than 30 Days

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of a foreign study stay lasting less than 30 days.

Learning outcomes:
By completing a shorter study stay, the PhD student demonstrates the ability to reflect on research problems and work critically with sources at an expert level and in an interdisciplinary context, while being able to generate new knowledge. He is able to actively communicate at an expert level in more than one language. He acts as a responsible independent scientist, works independently and in a group with the aim of pushing the boundaries of knowledge and transferring them to other areas of research, to practice and to the wider public. He can competently argue and explain his ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 34

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ ZSP2/22	**Course name:** International Study Stay more than 30 Days

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Completion of a foreign study stay lasting more than 30 days.

Learning outcomes:
By completing the study stay, the PhD student demonstrates the ability to reflect on research problems and work critically with sources at an expert level and in an interdisciplinary context, while being able to generate new knowledge. He is able to actively communicate at an expert level in more than one language. He acts as a responsible independent scientist, works independently and in a group with the aim of pushing the boundaries of knowledge and transferring them to other areas of research, to practice and to the wider public. He can competently argue and explain his ideas

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 13

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/MKZ/22	**Course name:** International abroad conference

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in an international conference abroad.

Learning outcomes:
By actively participating in an international scientific conference abroad, the phD student demonstrates a high level of ability to identify, evaluate, and apply correct scientific methods or research methodology in his scientific field. He demonstrates the ability to reflect on a specific scientific problem by using the latest approaches and applying them critically. Demonstrates competence to use existing theories and concepts in an innovative way, as well as generate new original scientific knowledge and communicate research results to a wider audience by adequate means and through a foreign language.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 109

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/DC/22	**Course name:** Local journal

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 6

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a national journal as author/co-author.

Learning outcomes:
By publishing in a national journal as an author/co-author, the PhD student demonstrates a high level of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DMPV/22	**Course name:** Methodology of Educational Research

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
Students prepare a detailed description of the theory application on the subject of their research in the form of presentation. Students can receive maximum of 50 points, the needed minimum is 26 points.
oral exam 0 to 50 points; summative assessment is the result of continuous assessment and oral exam.

Learning outcomes:
Getting the requested overview of the scientific methods for own successful educational research. Specifying and understanding the terms of use, advantages and disadvantages of the basic research forms (observation, pre-research, experimental, quasi-experimental, case study, qualitative, quantitative, historical, mixed research), principles of open science. Identifying and analyzing the methods and forms of research studied in a specific monograph or journal literature. Getting skills to apply gained knowledge to own scientific research in didactics. Getting key skills how to plan, implement, conduct, continuously and critically review and evaluate own research as it progresses.

Brief outline of the course:
The scientific method and its use in didactics. Stages of research, its preparation and organization. Research problem and the creation of a scientific hypothesis. Basic overview of current approaches to educational research. Pedagogical experiment. Quasi-experiment and case study. Methods for qualitative and quantitative research. Mixed method research. Analysis and application of theory in the study of scientific publications dealing with educational research. Planning, evaluation and control (management) own research as a scientific research project. The method of critical chain and critical path. Collecting data and conducting research work in the field. Open science.

Recommended literature:
1. Creswell, J. W., & Clark, V. L. P. (2017). Designing and Conducting Mixed Methods Research (3rd ed.). SAGE Publications, Inc.
2. Gavora, P., & kolektív autorov. (2010). Elektronická učebnica pedagogického výskumu. Univerzita Komenského. http://www.e-metodologia.fedu.uniba.sk/
3. Johnson, R. B., & Christensen, L. (2016). Educational Research: Quantitative, Qualitative, and Mixed Approaches (6th vyd.). SAGE Publications.

4. Pelikán, J. (2011). Základy empirického výzkumu jevů pedagogických. Karolinum, Univerzita Karlova.
5. Prokša, M., Held, Ľ., & kol. (2008). Metodológia pedagogického výskumu a jeho aplikácia v didaktikách prírodných vied. Univerzita Komenského.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DMTV/22	**Course name:** Modern Technologies in Education

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
assessment of partial assignments 20 points
presentation and defence of the project 20 points, oral examination 60 points
A 100-90 B 89-80 C 79-70 D 69-60 E 59-50 F 49-0

Learning outcomes:
The student should obtain and be able to apply knowledge and skills in
1. today's digital technologies, their possibilities and functionalities for education according to the current European framework DigCompEdu
2. designing and realizing educational activities using chosen digital technologies in hybrid educational space, in selected content and teaching methods in the frame of physical education, in order to develop students' scientific and digital literacy

Brief outline of the course:
1. Modern hybrid classroom and digital space in 21st century
- technological progress and the profile of the graduate, modern digital tools to schools, didactical principles
2. School documentation on-line, cloud repositories and services
- documents, gallery of the objects, working calendars
3. Digital hybrid workspace of the modern teacher
- cooperation and the use of digital technologies
4. The science classroom for inquiry based hybrid education
- basic principles of the classroom design and equipment and teaching in such a classroom
5. Digital information presentation
- interactive beamer, visualiser, digital microscope, DVBT, full HD imaging
6. Digital picture processing
- vector graphics, design of computer animation
7. Sound and video processing
interactive multimedia objects
8. Digital collaborative technologies
- interactive collaborative whiteboard, social ereader, evoting
9. Learning by inquiry in computer-based laboratory I.

- measurement with the use of datalogging
10. Learning by inquiry in computer-based laboratory II.
- measurement on videoclips
11. Learning by inquiry in computer-based laboratory III.
- modelling and computer simulations
12. Educational project
interactive multimedia tools for learning by inquiry with the use of digital technologies

Recommended literature:

1. Redecker, C., Punie, Y. (2017). European Framework for the Digital Competence of Educators: DigCompEdu. Luxembourg: Publications Office of the European Union, 2017
2. C. R. Tucker, T. Wycoff, a J. T. Green, Blended Learning in Action: A Practical Guide Toward Sustainable Change. Thousand Oaks: Corwin Press, 2016.
3. D. Bannister, Guidelines on Exploring and Adapting: LEARNING SPACES IN SCHOOLS. Brussels: European Schoolnet, 2017.
4. Didactical Outputs of national project IT Academy

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Jozef Hanč, PhD., doc. RNDr. Zuzana Ješková, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DMTF/22	**Course name:** Modern Trends in Physics Education

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 1 **Per study period:** 28 / 14
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: III.

Prerequisities:

Conditions for course completion:
two semestral projects,
oral exam

Learning outcomes:
To present results of research in the field of education and learning theory, in the field of science education and their influence to changes in the contents and methods of science education. To make students familiar with modern trends in science education those are applied worldwide. To point out at the conception of modern educational methods and hybrid forms, and their benefits for science education and STEM education.

Brief outline of the course:
Research results in the field of education and learning theory and in the field of science education. Reforms in science education. Importance of active approach in education. Role of digital technologies in building of scientific literacy. International projects dedicated to application of methods of active exploration by pupils. Results of research activities in science education. Analysis of case studies of pedagogical experiments and educational procedures. Informal education – its importance and trends. Concept maps.

Recommended literature:
1. Kireš, M., Ješková, Z., Ganajová, M., & Kimáková, K. Inquiry based activities in science education , part A, part B-Physics [in Slovak]. Bratislava: Štátny pedagogický ústav, 2016
2. Ambrose, S. A. et al. How Learning Works: Seven Research-Based Principles for Smart Teaching. San: Francisco: John Wiley & Sons. 2010
3. Fadel, C., Trilling, B., & Bialik, M. Four-dimensional Education. Boston: Center for Curriculum Redesign, 2015
4. Fraser, J. M., Timan, A. L., Miller, K., Dowd, J. E., Tucker, L., & Mazur, E. Teaching and physics education research: Bridging the gap. Reports on Progress in Physics, 77(3), 032401–032417, 2014
5. Khosrow-Pour (ed.) K-12 STEM Education: Breakthroughs in Research and Practice: Breakthroughs in Research and Practice. Hershey, IGI Global, 2017
6. D. Bannister, Guidelines on Exploring and Adapting: Learning spaces in schools. Brussels: European Schoolnet, 2017.

7. C. R. Tucker, T. Wycoff, a J. T. Green, Blended Learning in Action: A Practical Guide Toward Sustainable Change. Thousand Oaks: Corwin Press, 2016.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MONB/22	**Course name:** Monograph

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 20

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Co-author of the monograph.

Learning outcomes:
By publishing a monograph, the PhD student demonstrates a high level of ability to identify, evaluate, and apply correct scientific methods or research methodology. It demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The doctoral student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ MONA/22	**Course name:** Monograph in a renowned publishing house
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 40	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Co-author of a monograph in a renowned publishing house.	
Learning outcomes: By publishing a monograph in a renowned publishing house, the PhD student demonstrates a high level of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The doctoral student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/DK/04	**Course name:** National Conference

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in the home conference.

Learning outcomes:
By actively participating in the national scientific conference, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology in his scientific field. He demonstrates the ability to reflect on a specific scientific problem by using the latest approaches and applying them critically. Demonstrates competence in using existing theories and concepts in an innovative way, as well as generating new original scientific knowledge and communicating research results to a wider audience using adequate means and through the Slovak language.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 187

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/NRZ/22	**Course name:** Non-Reviewed International or National Proceedings

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
A publication published in a non-reviewed foreign or national journal as an author/co-author.

Learning outcomes:
By publishing in a non-reviewed foreign or national journal as an author/co-author, the PhD student demonstrates the ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The phD student demonstrates the ability to finalize his own thoughts in a written speech.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 18

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: KPE/ PgVU/17	**Course name:** Pedagogy for University Teachers

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 28s
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
1. Development of a teaching diary—100%
2. Compulsory active participation and attendance in accordance with the Study Regulations.

Learning outcomes:
After completing the course, the student will acquire knowledge, skills, and competencies, i.e., will be able to:
Knowledge
Define and apply basic didactic principles, methods, forms, and tools in the teaching process of university-level professional subjects. Identify and specify educational procedures of a university teacher aimed at effective teaching management, pedagogical diagnostics, and assessment of learning outcomes. Recognize different approaches to pedagogical evaluation and their impact on improving the quality of the educational process at the university level.
Skills
Implement effective educational methods and techniques into the teaching of professional subjects, tailored to the needs of university students. Conduct pedagogical diagnostics, assess students' progress, and apply appropriate evaluation methods to improve learning outcomes. Analyze and reflect on one's own teaching process, identify areas for improvement, and enhance the teaching of professional subjects, including the rationalization of the time and content structure of teaching. Present specific proposals for improving the teaching process, including the use of new technologies and innovative pedagogical approaches.
Competencies
Confidently and effectively manage the teaching of university subjects, applying educational competencies that consider the specifics of higher education. Critically reflect on one's own pedagogical practice and the learning outcomes of students to improve teaching methods and achieve a higher quality of the educational process. Apply innovative solutions to streamline and optimize the teaching process, aiming to increase the engagement and success of university students.

Brief outline of the course:
The personality of a university teacher. Teaching styles. Student in university education. Student learning styles. Possibilities of adapting teaching styles and student learning styles. University teacher–student interaction and communication in the teaching process. Pedagogical competencies

of a university teacher. Didactic analysis of the curriculum; teaching materials and textbooks. Forms of university teaching. Methods of university teaching. Verification methods and student assessment. Creation of a didactic test. Designing university teaching process. University teacher self-reflection.

Recommended literature:

Beránek, J. (2023). Moderní pedagogické metody a přístupy. Praha: Portál.
Fiala, M. (2023). Didaktika a metodika v současné škole. Praha: Grada Publishing.
Kováč, M. (2023). Vzdelávanie v 21. storočí: Inovatívne prístupy a metódy. Nitra: Vydavateľstvo UKF v Nitre.
Koudelka, J. (2023). Moderní didaktika a její aplikace. Praha: Karolinum.
Křížová, M., & Šebová, P. (2023). Vzdělávání učitelů: Teoretické a praktické přístupy. Praha: Triton.
Kučerová, M. (2023). Vzdělávání učitelů a profesionální rozvoj. Praha: Triton.
Mocová, M., & Lázňovská, M. (2023). Pedagogika a jej aplikácie v praxi. Bratislava: Vydavateľstvo Spolku slovenských pedagogických pracovníkov.
Novák, J., & Pol, M. (2024). Pedagogické výzkumy a inovace ve vzdělávání. Praha: Portál.
Sikora, J. (2022). Didaktika a metodika vzdelávania: Nové výzvy a trendy. Bratislava: Vydavateľstvo Univerzity Komenského v Bratislave.
Škoda, J. (2022). Efektivní výuka: Praktické strategie a metody. Praha: Grada Publishing.
Švec, J. (2023). Didaktika a školní politika: Teorie a praxe. Praha: Grada Publishing.
Vojtová, K. (2024). Diferenciace a inkluze ve vzdělávání. Praha: Wolters Kluwer.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 152

abs	n	neabs
98.03	0.66	1.32

Provides: doc. PaedDr. Renáta Orosová, PhD.

Date of last modification: 14.09.2024

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DPOM/22	**Course name:** Physics Observation, Exploring and Measurements

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 2 **Per study period:** 14 / 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2., 4.

Course level: III.

Prerequisities:

Conditions for course completion:
Student prepares and carries out two experimentally solved problems in the form of school observation and measurement.
oral exam connected with realization and explanation of experimental problems.

Learning outcomes:
To develop experimental skills to propose, make and evaluate a school physics experiment. To link physics interpretation of phenomenon with its observation, demonstration and measurements in a school physics laboratory. Student obtains an insight into different approaches to experimental solution of more difficult physics problems and to complex exploration of selected phenomena.

Brief outline of the course:
Observation and demonstrations of phenomena: Inelastic collision; Multiple-ball collision; Ice bulge; Coanda effect; Magnetohydrodynamics; Steam boat; Siphon; Spreading of electromagnetic waves.
Exploration of physics phenomena: Electrochemical cell; Peltier effect; Efficiency of hydrogen fuel cell; Dynamics of movement of a model car powered by an engine using an elastic air-filled toy-balloon as the energy source; Total internal reflection; Magnetic levitation; Non-stationary state of tungsten filament of bulb when switch on; Geyser.
Measurement of physical quantities: Electric conductivity of gelatine solution as a function of temperature upon cooling; Determination efficiency of heat engine; Coefficient of restitution.
A ratio between the thermal energy and light energy emitted from an electric bulb.

Recommended literature:
Kluiber, Z.: Tvůrčí náboj úloh Turnaje mladých fyziků. MAFY, Hradec Králové, (2005)
J. Walker, “The Flying Circus of Physics with Answers,” New York: John Wiley &Sons,(1977)
J. Walker, “The Flying Circus of Physics with Answers,” 2ns edition, New York: John Wiley &Sons,(2007)
Z. Kluiber, T. Stanisic, V. Skocdopole, “The future is influenced by the Gifted”, Prague: Orbis, (2008).

Course language:
Slovak, English

Notes:	
Course assessment Total number of assessed students: 0	
N	P
0.0	0.0
Provides: doc. RNDr. Marián Kireš, PhD., doc. RNDr. Zuzana Ješková, PhD.	
Date of last modification: 17.02.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/POP/22	**Course name:** Popularisation of science

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active involvement in the popularization of science.

Learning outcomes:
Demonstrated ability to present science to the lay public, use interactive methods of scientific communication, identify the target group and adapt the communication language to the level of professional knowledge. A PhD student is able to arouse interest and motivate specific target groups in the field of his scientific work, but also in the wider context of science

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 69

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/VYS/22	**Course name:** Presentation in Seminar

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Presentation at the seminar

Learning outcomes:
By actively participating in the seminar, the PhD student demonstrates the ability to identify, evaluate, and apply correct scientific methods or research methodology in his field of study. He demonstrates the ability to reflect on a specific scientific problem by using the latest approaches and applying them critically. Demonstrates competence in using existing theories and concepts in an innovative way, as well as generating new original scientific knowledge and communicating research results by adequate means and through Slovak or a foreign language.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 44

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ZRIG/22	**Course name:** Principal investigator of an internal grant (VVGS)

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Principal investigator of an internal grant (VVGS)

Learning outcomes:
The PhD student demonstrates the ability to process a successful application for his own research problem within the internal grant system at UPJŠ. Acquires skills with the design of research stages, their time schedule, measurable outputs and adequate distribution of funds. The very solution of the internal VVGS grant acquires the ability to implement the project intention according to the established procedure, to be responsible for achieving the set outputs. As a responsible researcher, the PhD student acquires competencies in project management, its administration, and presentation of results.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 22

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: KPPaPZ/PsVU/17	**Course name:** Psychology for University Lecturers

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 28s
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Case study, micro-output, its analysis
Current modifications of the course are listed in the electronic bulletin board of the course.

Learning outcomes:
After completing the course, students will gain knowledge that allows them to understand, summarize and explain selected psychological knowledge from cognitive psychology, emotion and motivation psychology, personality psychology, developmental, social, educational psychology and health psychology. They will acquire skills to apply the above psychological knowledge necessary for the professional, competent performance of university teaching practice of doctoral students to create and implement the teaching of a professional topic with applied psychological knowledge and develop the competences to create and implement teaching of a professional topic with the application of psychological knowledge, as well as to evaluate their performance and the performance of their classmates in the form of constructive feedback.

Brief outline of the course:
The content of the course is based on selected psychological knowledge of cognitive psychology, psychology of emotions and motivation, personality psychology, developmental, social, educational psychology and health psychology. Teaching is realized by a combination of lectures with interactive, experiential methods, discussion, open communication with mutual respect, support of independence, activity and motivation of students. Syllabus: University teacher and his work in the teaching process with a focus on: teachers in relation to themselves (cognitive, personal, social and competencies in the use of methods), in relation to students and as part of the teacher-student relationship on the basis of selected areas of cognitive psychology, psychology of emotions and motivation, developmental psychology, social psychology, educational psychology and health psychology with application to the university environment

Recommended literature:
Alexitch, L. R. (2005). Applying social psychology to education. Social Psychology.–Ed.: Schneider F., Gruman J., Coutts L.–Sage Publications, Inc, 205-228.
Fry, H., Ketteridge, S., & Marshall, S. (2008). A handbook for teaching and learning in higher education: Enhancing academic practice. Routledge.
Mareš, J.: Pedagogická psychologie. Portál, 2013.

Kniha psychologie. Universum, 2014
Čáp, J., Mareš, J.: Psychologie pro učitele. Praha: Portál 2007.
Vágnerová, M.: Školní poradenská psychológie pro pedagogy. Praha: Karolínum 2005.
Cuevas, J. A., Childers, G., & Dawson, B. L. (2023). A rationale for promoting cognitive science in teacher education: Deconstructing prevailing learning myths and advancing research-based practices. Trends in neuroscience and education, 100209.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 87

abs	n	neabs
98.85	0.0	1.15

Provides: PhDr. Anna Janovská, PhD.

Date of last modification: 09.12.2024

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q1SA/22	**Course name:** Q1 journal as co-author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q1 as co-author.

Learning outcomes:
By publishing in a journal of category Q1 as a co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 26

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q11A/22	**Course name:** Q1 journal as first or corresponding author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 40

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q1 as first or corresponding author

Learning outcomes:
By publishing in a journal of category Q1 as the first or corresponding author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 12

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q2SA/22	**Course name:** Q2 journal as co-author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 20

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q2 as co-author.

Learning outcomes:
By publishing in a journal of category Q2 as a co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 23

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q21A/22	**Course name:** Q2 journal as first or corresponding author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 30

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q2 as first or corresponding author.

Learning outcomes:
By publishing in a journal of category Q2 as the first or corresponding author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 16

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q3SA/22	**Course name:** Q3 journal as co-author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 15

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q3 as co-author.

Learning outcomes:
By publishing in a journal of category Q3 as a co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q31A/22	**Course name:** Q3 journal as first or corresponding author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 25

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q3 as first or corresponding author

Learning outcomes:
By publishing in a journal of category Q3 as the first or corresponding author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ Q4SA/22	**Course name:** Q4 journal as co-author

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 10

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Publication accepted in a journal of category Q4 as co-author.

Learning outcomes:
By publishing in a journal of category Q4 as a co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ Q41A/22	**Course name:** Q4 journal as first or corresponding author
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Publication accepted in a journal of category Q4 as first or corresponding author.	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 2	

abs	n
100.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/RZ/22	**Course name:** Reviewed International or National Proceedings

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
A publication published in a peer-reviewed foreign or national proceedings as an author/co-author.

Learning outcomes:
By publishing in a peer-reviewed foreign or national journal as an author/co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to critically evaluate and respond to reviewers' suggestions, to finalize his own ideas.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 82

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DSFP/22	**Course name:** Science Exploration of Selected Physical Problems I

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
The objective of the subject is to create space for the deeper study of selected physical problems that take into account current developments in experimental physics. The student will obtain an overview and will understand the basic physical principles of the studied problems. For the successful completion of the subject, the student must demonstrate sufficient understanding of the term, phenomena and law of physics from the selected filed of physical problems. The condition for obtaining credits is passing an oral examination and preparation of two semester work. Credit assessment of the subject takes into account the following student load: Direct teaching (2 credits), self-study (1 credit), semester work (1 credit) and evaluation (1 credit). The minimum boundary for completing the subject is to obtain at least 50% of the total point evaluation, using the following evaluation scale: A (90-100%), B (80-89%), C (70-79%), D (60- 69%), E (50-59%), F (0-49%).

Learning outcomes:
After completing the lectures and taking the exam, the student will have knowledge of a selected range of physical problems.

Brief outline of the course:
1. Crystal structure, periodic cluster of atoms, basic types of lattices, simple crystal structures
2. Crystal bond, inert gas crystals, ion crystals, covalent crystals, metal crystals, hydrogen bond crystals
3. Fonons, lattice vibrations, quantizing lattice oscillations, lattice thermal properties, measuring heat lattice, thermal conductivity
4. Fermi gas of free electron, metallic heat capacity, electrical conductivity and ohms law, Hall phenomena
5. Topology, Electron Movement on Thin Layers, Surface states, Topological Insulators, Arpes Measurement
6. superconductivity, basic properties and experimental overview, heat capacity, theoretical overview, BCS theory, the superconductors of the first and second types
7. Vacuum technologies, basic overview, and properties
8. Low temperatures, cryoliquids, cryostats, refrigerators, magnetokaloric phenomenon
9. Basic properties of quantum computers, QBIT definition, QBIT implementation, quantum computer overview, base principles and gates

10. Molecular, single and low-dimensional magnetism, basic properties
10. Nanotechnology, production of nanostructures, microscopy, atomic force microscope, magnetic force microscope
11. Large experimental laboratory, neutron scattering, large magnetic fields, mion spectroscopy
12. Quantum communication and quantum internet

Recommended literature:

1. Ch. Kittel: Úvod do fyziky pevných látek, Academia, 1985.
2. L. Skrbek: Fyzika nízkých teplot (I. + II. část), MatfyzPress, 2011.
3. C. Benelli, D. Gatteschi, Introduction to Molecular Magnetism: From Transition Metals to Lanthanides, Copyright © 2015 Wiley#VCH Verlag GmbH & Co. KGaA, 2015.
4. F. Ortmann, S. Roche, S. O. Valenzuela, Topological Insulators: Fundamentals and Perspectives, John Wiley & Sons, 2015.
5. P. Slavíček, V. Štěpánová, J. Kelar, Vakuová fyzika 1, Masarykova univerzita, 2016, Brno.
6. A. Oriňák, R. Oriňáková, Nanotechnológie, Univerzita Pavla Jozefa Šafárika v Košiciach, 2012

Course language:
1. Slovak
2. English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: RNDr. Vladimír Tkáč, PhD., doc. RNDr. Marián Kireš, PhD., doc. RNDr. Janka Vrláková, PhD.

Date of last modification: 20.09.2021

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DSFP2/22	**Course name:** Science Exploration of Selected Physical Problems II

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
three semester projects (individual work on selected physical problems)
oral exam

Learning outcomes:
Presenting selected physical problems in electricity and magnetism with the aim of a deeper, unifying view and understanding fundamental theoretical knowledge together with modern trends in the field. Getting skills to prepare and modify selected physical problems with the application theme, which demonstrate the importance of physical education for society and of which interpretation is related to students' knowledge level at secondary schools.

Brief outline of the course:
Review of key concepts and principles in electricity and magnetism. Application of knowledge in different systems using computer simulations. Knowledge of theory of relativity in the context of electricity and magnetism. Microscopic view of the phenomena in electrical circuits. Selected physical problems (sparks in the air and atmospheric electricity, surface charges in circuits, accelerators and relativistic collisions of elementary particles, heart electrocardiogram, bone strength)
Review of basic concepts of condensed matter magnetism. Carriers of the magnetic moment. Magnetic properties of matter without magnetic ordering. Magnetic properties of matter with magnetic ordering. Processes of magnetic reversal. Magnetic resonance. Transport properties of semiconductors. Phenomena occurring at the interface between two semiconductors, metal and semiconductor. Applications of the theory in describing semiconductors devices.

Recommended literature:
1. R. Chabay, B. Sherwood: Matter and interactions II - Electric and Magnetic Interactions, 4th ed. J.Willey and Sons, Inc. New York, 2015
2. S. Chikazumi: Physics of Magnetism, 2nd ed. J.Willey and Sons, Inc. New York, 2009
3. H. Kronmüller: Handbook of magnetism and advanced magnetic materials, Willey, 2007
4. D.J.Roulston An Introduction to the Physics of Semiconductor Devices, Oxford University Press, 1999

Course language:

Slovak, English

Notes:

Course assessment
Total number of assessed students: 2

N	P
0.0	100.0

Provides: doc. RNDr. Janka Vrláková, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/VPZ/22	**Course name:** Scientific work after sending to the editorial office

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Scientific work after being sent to the editorial office as an author/co-author.

Learning outcomes:
By sending a manuscript to the editors of a scientific journal as an author/co-author, the PhD student demonstrates a high degree of ability to identify, evaluate, and apply correct scientific methods or research methodology. He demonstrates the ability to reflect on a scientific problem by using the latest approaches and applying them critically. He demonstrates the competence to use existing theories and concepts in an innovative way, as well as to generate new original scientific knowledge, which he can publish according to the highest qualitative and ethical standards of the field. The PhD student demonstrates the ability to formulate his own ideas in a structured form.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 21

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DVDF/22	**Course name:** Selected Chapters from Didactics of Physics

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 2 **Per study period:** 28
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration of an up-to-date overview of trends in physical education.

Learning outcomes:
Extended and in-depth knowledge and skills from the didactics of physics towards the application of modern teaching methods, forms and didactic tools in physical education. The PhD student is oriented in current trends in physical education, has an overview of current scientific publications in the didactics of physics. He orients himself in the issues of STEM education, digital transformation and innovation in science education.

Brief outline of the course:
History of didactics of physics in Slovakia. Educational systems in Slovakia and abroad. Reforms in science education. Interactive and activating methods in science education. Modern didactic tools and organization forms. Importance of primary knowledge and its utilization in development of conceptual understanding. Evaluation of knowledge and skills. Formative assessment. Standardized international tools for evaluation (PISA, TIMSS, conceptual tests). Teacher as a creator of a grant project.

Recommended literature:
HARLEN, W. (ed.) 2010. Principles and big ideas of science education [online]. Herts: Association for Science Education. ISBN 978086357 4 313. Dostupné z: www.ase.org.uk
HARLEN, W. (ed.) 2015. Working with Big Ideas of Science Education [online]. Science Education Programme of IAP: Trieste. ISBN 9788894078404. Dostupné z: http://www.interacademies.net/
Andrade, H. (2019). A critical review of research on student self-assessment. Frontiers in Education, 4(87), pp. 1-13
Bennett, R. (2011). Formative assessment: A critical review. Assessment in Education: principles, policy & practice, 18(1), pp. 5-25.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Marián Kireš, PhD., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DVKF/22	**Course name:** Selected Chapters of Physics

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Given the thematic focus of the doctoral student's dissertation and the professional scope of completed courses at the master's degree, the aim of the course is to create space for deeper study of physical disciplines related to the topic of the dissertation. The basis of the content of the discipline is determined by the syllabus of the course, which will be supplemented by the guarantor of the study program with additional chapters from physics courses at the master's degree in physics at PF UPJŠ in Košice (from study programs: Fm, FKLm, BFm, JSFm).
To successfully complete the course (full-time, if necessary distance), the student must demonstrate sufficient understanding of the concepts, phenomena and laws of physics in a selected range of physical problems.
Credit evaluation takes into account the scope of teaching (3 hours of lectures, 3 credits), self-study (1 credit), evaluation (1 credit) and the fact that it is a compulsory subject of the dissertation exam. The minimum limit for successful completion of the course is the elaboration of two semester papers on selected topics and obtaining 50 points in the oral exam from the subsequent point evaluation.
Rating scale
A 100-91
B 90-81
C 80-71
D 70-61
E 60-50
Fx 49-0

Learning outcomes:
After completing the lectures and taking the exam, the student will have knowledge of a selected range of physical problems.

Brief outline of the course:
1. Magnetic resonance, description of magnetic moment behavior in stationary magnetic field, absorption of high frequency electromagnetic field, examples of magnetic resonance phenomena (electron paramagnetic resonance, nuclear magnetic resonance), use of magnetic resonance in scientific research and in practice.

2. Special theory of relativity in terms of electromagnetic field. Analysis of electromagnetism phenomena (electromagnetic induction and displacement current current).
3. Special cases of behavior of electromagnetic waves: surface phenomena, long lines, standing waves.
4. Magnetism of substances with disordered moments. Analysis of diamagnetism phenomena: orbital electrons, conductivity electrons and superconductors. Analysis of paramagnetism phenomena from the point of view of classical and quantum physics, paramagnetism of conduction electrons.
5. Magnetism of substances with ordered moments I: analysis of phenomena of ferromagnetism, from the point of view of classical and quantum physics.
6. Magnetism of substances with ordered moments II: analysis of phenomena by antiferromagnetism and ferromagnetism from the point of view of classical and quantum physics.
7. Properties of modern ferromagnetic materials (soft and hard magnetic materials), possibilities of their use in practice.
8. Properties of semiconductors I. - description of behavior of homogeneous semiconductors and semiconductors with one PN junction and analysis of the possibility of their use in practice.
9. Properties of semiconductors II. - description of the behavior of semiconductors with multiple PN junctions and optoelectronic components and analysis of the possibility of their use in practice.
10. Selected lecture on theoretical physics according to the interest and needs of students.
11. Selected lecture on nuclear physics according to the interest and needs of students.
12. Selected lecture on biophysics according to the interest and needs of students.
13. Presentation of students' work on assigned topics

Recommended literature:

1. T. Matsushita: Electricity and Magnetism, Springer, 2017
2. S. Chikazumi: Physics of Magnetism, J.Willey and Sons, Inc. New York, London, Sydney, 1997.
3. D. Jiles: Introduction to magnetism and magnetic materials, Chapman&Hall, London, New York, Tokyo, Melbourne, Madras, 1991
4. J. M. D. Coey: Magnetism and Magnetic Materials, Cambridge University Press, 2021
5. H. Kronmüller, S. Parkin: Handbook of Magnetism and Advanced Magnetic Materials, Wiley, New York, 2007
6. S. Tumanski: Handbook of Magnetic Measurements, Taylor & Francis, 2011
7. R.Dalven: Introduction to Applied Solid State Physics, Plenum publishing corporation New York, 1990
8. J. Voves, J. Kodeš: Elektronické součástky nové generace, Grada, Praha, 1995

Due to the content of the course, the literature will be specified on the basis of a selection of lectures always at the beginning of the semester.

Course language:

English

Notes:

Presence form represents a standart form for the course, if a need arises, the course is performed using MS Teams.

Course assessment

Total number of assessed students: 0

N	P
0.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc.
Date of last modification: 22.11.2021
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DVKF2/22	**Course name:** Selected Chapters of Physics II

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: III.

Prerequisities:

Conditions for course completion:
partial assessment based on two semestral projects.
examination

Learning outcomes:
Based on the concrete goals of the student´s thesis and the extent and content of the subjects attended by the student at the master level the course will provide deeper insight into the branch of physics with regard to the thesis topic. The concrete content will be selected by the guarantee and it will include the selected parts of the physics master degree courses at Faculty of Science, UPJS Kosice (study programmes of Fm, FKLm,BFm, JSFm).

Brief outline of the course:
Based on the corresponding master degree physics course programme: Fm, FKLm, BFm, JSFm.

Recommended literature:
Literature corresponding to the selected physical topics
Current and up-to-date scientific publications connected with the selected physical topics

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 0

N	P
0.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Janka Vrláková, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DMOF/22	**Course name:** Selected Topics in Modern Physics

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: 3 **Per study period:** 42
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1., 3.

Course level: III.

Prerequisities:

Conditions for course completion:
Students prepare a seminar work in form of a scientific paper, which is dealt with an application of modern physics in everyday phenomena and devices around us. The work contains not only basic physical information but also includes a correct mathematical theory describing the chosen phenomena or device. In addition the seminar work concerns visualization of the phenomena, which means using virtual PC experiments (simulations). Students can receive maximum of 50 points, the needed minimum is 26 points.
oral exam 0 to 50 points; final assessment is the result of continuous assessment and oral exam.

Learning outcomes:
Consolidating and expanding the theoretical knowledge gained from previous undergraduate studies in quantum mechanics and general relativity.
Getting a higher level of conceptual (physical) understanding and the unifying view of the fundamental principles of modern physics. Getting knowledge in application and didactic aspects of the issue (what practical applications we know; how to apply theoretical knowledge in practical tasks and applications of modern physics, with which we encounter in everyday life; what virtual PC experiments can be used; what conceptual understanding is needed).

Brief outline of the course:
Overview of basic concepts and principles of special relativity. Description of flat and curved spacetime in the vicinity of spherical objects - the Minkowski, Schwarzschild and Kerr metrics, corresponding symmetries and conservation laws, theory tests in the solar system, computer simulations as virtual experiments in relativity. Applications of theory: accelerators, modern diagnostic techniques (PET, MRI); GPS, motion around black holes, gravitational lenses.
Overview of basic concepts and principles of quantum mechanics. The standard model and elementary particles. Description of the micro-world in terms of path integrals, concept of propagator, theory application in elementary quantum systems, symmetries and their fundamental consequences for quantum statistics of multi-particle systems, conceptual issues of quantum mechanics, computer simulations as virtual experiments in quantum theory.
Applications of theory: quantum theory of conductivity in LED devices, semiconductor laser, SQUIDs sand MOSFETs

Recommended literature:

1. Moore, T. A (2017) Six Ideas That Shaped Physics - Unit C, Unit R, Unit Q, 3rd ed., Boston Mc Graw Hill, Boston
2. Hartle, J. B. (2021). Gravity: Introduction to Einstein's General Relativity, Cambridge: Cambridge University Press, 602 pp.
3. Taylor, E.F., Wheeler, J.A., Bertschinger, E. (2018) Exploring Black Holes - Introduction to General relativity, 2nd ed., 2018, https://archive.org/details/exploringblackholes
4. Rae, A.I., Napolitano, J.J (2015). Quantum mechanics, 6th ed., London: CRC Press
5. Hughes, C., Isaacson, J., Perry, A., Sun, R. F., Turner, J. (2021). Quantum Computing for the Quantum Curious. Cham: Springer International Publishing.
6. Belloni, M., Christian, W., Cox, A.J. (2022) Physlet Quantum Physics: An Interactive Introduction, London: Pearson education, 3rd ed.

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Jozef Hanč, PhD., prof. RNDr. Peter Kollár, DrSc.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF1a/11	**Course name:** Seminar Theory of Physics Teaching I

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 1 **Per study period:** 14 / 14
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
individual presentation at the seminar, active participation at the seminars
completion

Learning outcomes:
Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.

Brief outline of the course:
The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure:
• Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation
• Survey of the content of journals, browsing and searching towards the certain topic
• Current events for teachers and students: goals, presentation topics, outputs
• PhD students´ presentations to the partial problems concerning their PhD thesis
• Presentations of the members of the physics education group
• Presentations of invited lectures from partner institutions

Recommended literature:
Printed and electronic up-to-date information sources
Conference proceedings, web portals of events and conferences
Journals on physics education, other publications aimed at physics education

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 11	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Marián Kireš, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF1b/11	**Course name:** Seminar Theory of Physics Teaching II
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 1 / 1 **Per study period:** 14 / 14 **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course: 2.	
Course level: III.	
Prerequisities:	
Conditions for course completion: individual presentation at the seminar, active participation at the seminars completion	
Learning outcomes: Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.	
Brief outline of the course: The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure: • Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation • Survey of the content of journals, browsing and searching towards the certain topic • Current events for teachers and students: goals, presentation topics, outputs • PhD students´ presentations to the partial problems concerning their PhD thesis • Presentations of the members of the physics education group • Presentations of invited lectures from partner institutions	
Recommended literature: Printed and electronic up-to-date information sources Conference proceedings, web portals of events and conferences Journals on physics education, other publications aimed at physics education	
Course language: Slovak, English	
Notes:	

Course assessment Total number of assessed students: 11	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF2a/11	**Course name:** Seminar Theory of Physics Teaching III

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 1 **Per study period:** 14 / 14
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
individual presentation at the seminar, active participation at the seminars
completion

Learning outcomes:
Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.

Brief outline of the course:
The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure:
• Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation
• Survey of the content of journals, browsing and searching towards the certain topic
• Current events for teachers and students: goals, presentation topics, outputs
• PhD students´ presentations to the partial problems concerning their PhD thesis
• Presentations of the members of the physics education group
• Presentations of invited lectures from partner institutions

Recommended literature:
Printed and electronic up-to-date information sources
Conference proceedings, web portals of events and conferences
Journals on physics education, other publications aimed at physics education

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 10	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Marián Kireš, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF2b/11	**Course name:** Seminar Theory of Physics Teaching IV

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 1 **Per study period:** 14 / 14
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
individual presentation at the seminar, active participation at the seminars
completion

Learning outcomes:
Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.

Brief outline of the course:
The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure:
• Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation
• Survey of the content of journals, browsing and searching towards the certain topic
• Current events for teachers and students: goals, presentation topics, outputs
• PhD students´ presentations to the partial problems concerning their PhD thesis
• Presentations of the members of the physics education group
• Presentations of invited lectures from partner institutions

Recommended literature:
Printed and electronic up-to-date information sources
Conference proceedings, web portals of events and conferences
Journals on physics education, other publications aimed at physics education

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 10	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF3a/11	**Course name:** Seminar Theory of Physics Teaching V
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 1 / 1 **Per study period:** 14 / 14 **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course: 5.	
Course level: III.	
Prerequisities:	
Conditions for course completion: individual presentation at the seminar, active participation at the seminars completion	
Learning outcomes: Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.	
Brief outline of the course: The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure: • Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation • Survey of the content of journals, browsing and searching towards the certain topic • Current events for teachers and students: goals, presentation topics, outputs • PhD students´ presentations to the partial problems concerning their PhD thesis • Presentations of the members of the physics education group • Presentations of invited lectures from partner institutions	
Recommended literature: Printed and electronic up-to-date information sources Conference proceedings, web portals of events and conferences Journals on physics education, other publications aimed at physics education	
Course language: Slovak, English	
Notes:	

Course assessment Total number of assessed students: 7	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Marián Kireš, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF3b/11	**Course name:** Seminar Theory of Physics Teaching VI
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 1 / 1 **Per study period:** 14 / 14 **Course method:** present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course: 6.	
Course level: III.	
Prerequisities:	
Conditions for course completion: individual presentation at the seminar, active participation at the seminars completion	
Learning outcomes: Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.	
Brief outline of the course: The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure: • Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation • Survey of the content of journals, browsing and searching towards the certain topic • Current events for teachers and students: goals, presentation topics, outputs • PhD students´ presentations to the partial problems concerning their PhD thesis • Presentations of the members of the physics education group • Presentations of invited lectures from partner institutions	
Recommended literature: Printed and electronic up-to-date information sources Conference proceedings, web portals of events and conferences Journals on physics education, other publications aimed at physics education	
Course language: Slovak, English	
Notes:	

Course assessment Total number of assessed students: 6	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DTVF4a/11	**Course name:** Seminar Theory of Physics Teaching VII

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 1 **Per study period:** 14 / 14
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 7.

Course level: III.

Prerequisities:

Conditions for course completion:
individual presentation at the seminar, active participation at the seminars
completion

Learning outcomes:
Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.

Brief outline of the course:
The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure:
• Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation
• Survey of the content of journals, browsing and searching towards the certain topic
• Current events for teachers and students: goals, presentation topics, outputs
• PhD students´ presentations to the partial problems concerning their PhD thesis
• Presentations of the members of the physics education group
• Presentations of invited lectures from partner institutions

Recommended literature:
Printed and electronic up-to-date information sources
Conference proceedings, web portals of events and conferences
Journals on physics education, other publications aimed at physics education

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 6	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Marián Kireš, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ DTVF4b/11	**Course name:** Seminar Theory of Physics Teaching VIII

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 1 / 1 **Per study period:** 14 / 14
Course method: present

Number of ECTS credits: 3

Recommended semester/trimester of the course: 8.

Course level: III.

Prerequisities:

Conditions for course completion:
individual presentation at the seminar, active participation at the seminars
completion

Learning outcomes:
Discuss systematically about the up-to-date problems concerning education in physics and research in the field of physics education in Slovakia and abroad in order to expand knowledge and enhance argumentation skills and competencies, use the experience and knowledge gained at study stays and national and international conferences, seminars and other events that deal with education in physics.

Brief outline of the course:
The seminar content will be updated according to the current situation and events running in the field of physics education, however generally, it will have the following structure:
• Conferences aimed at the education in physics, conference theme, invited lectures, presentations, trends and themes to foster future cooperation
• Survey of the content of journals, browsing and searching towards the certain topic
• Current events for teachers and students: goals, presentation topics, outputs
• PhD students´ presentations to the partial problems concerning their PhD thesis
• Presentations of the members of the physics education group
• Presentations of invited lectures from partner institutions

Recommended literature:
Printed and electronic up-to-date information sources
Conference proceedings, web portals of events and conferences
Journals on physics education, other publications aimed at physics education

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 4	
abs	n
100.0	0.0
Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD.	
Date of last modification: 03.05.2015	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: Dek. PF UPJŠ/JSD/14	**Course name:** Spring School for PhD Students

Course type, scope and the method:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 4d
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Active participation in the Spring School of PhD students of UPJŠ.

Learning outcomes:
By actively participating in the Spring School of PhD Students of UPJŠ, the PhD student demonstrates a high level of ability to process the issues of his dissertation for a multidisciplinary audience with an emphasis on clarifying the motivation, scientific problem, processing methodology and own contribution to the solution of the selected topic. The PhD student demonstrates the ability to professionally discuss various research topics, present his own positions and accept a plurality of opinions. Demonstrates the ability to communicate research results to a wider professional audience with adequate means and through the Slovak language.

Brief outline of the course:
1. Interdisciplinary lectures from the fields of medicine, natural sciences, law, public affairs, humanities. Lecturers - top foreign or national experts from the mentioned fields.
2. Scientific lectures in sections created within related disciplines. Lecturers - top experts from UPJŠ from the mentioned fields.
3. Scientific contributions of PhD students in sections of related fields.
4. Panel discussions on the issue of PhD studies and current trends in the development of scientific disciplines at UPJŠ.

Recommended literature:
Proceedings of the Spring School of Doctoral Students.

Course language:

Notes:

Course assessment
Total number of assessed students: 203

abs	n
100.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD.

Date of last modification: 08.11.2022
Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DSMV/22	**Course name:** Statistical Methods in Educational Research

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 1 **Per study period:** 28 / 14
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Using technologies (open data science tools) students collect data from own research or find and prepare model data from an existing research for statistical analysis. Students prepare a detailed description of the theory application to model or own data in their research work in the software environment and create a report in the form of presentation. Students can receive maximum of 50 points, the needed minimum is 26 points.
oral exam 0 to 50 points; final assessment is the result of continuous assessment and oral exam.

Learning outcomes:
Getting the requested overview of statistical methods and digital technologies for collecting, analyzing and interpretation of data and research results in didactics. Understanding and getting skills to apply statistical methods in various forms of didactic research (observation, pre-research, pedagogical experiment, quasi-experiment, case study, qualitative research, mixed method research, historical research). Being familiar with software technologies and its use for effective data collection. Being familiar with statistical methods and their application to obtained research data in the chosen software environment (freely available data science tools based on R and Python).
Identifying and analyzing validity and reliability of statistical methods of research studied in a specific monograph or journal literature. Getting skills to apply gained knowledge in statistical analysis of own scientific research in the field of didactics.

Brief outline of the course:
Scientific methods of educational research data collection. Available software technology for immediate and long-term data collection. Descriptive statistics in educational research. Visualization and interpretation of results in a spreadsheet (Excel). Analysis in professional statistical software (free software R). Inductive statistics in educational research. Methods of inductive statistics in a spreadsheet environment and professional statistical software. Statistical analysis, processing and interpretation of various research forms in didactics (observation, pre-research, pedagogical experiment, quasi-experiment, case study, qualitative research, mixed method research, historical research). Principles of analysis and evaluation of a survey and a diagnostic test using descriptive and inductive statistics in software environment. Statistical

methods for assessing validity and reliability of obtained data and results. Analysis and application of statistical methods in the study of scientific publications and in own research work.

Recommended literature:

1. Cumming, G., & Calin-Jageman, R. (2016). Introduction to the New Statistics: Estimation, Open Science, and Beyond (1 edition). Routledge.
2. Utts, J. M., & Heckard, R. F. (2014). Mind on Statistics (5 edition). Cengage Learning.
3. Wilcox, R. R. (2017). Understanding and Applying Basic Statistical Methods Using R (1 edition). Wiley.
4. Wintjen, M. (2020). Practical Data Analysis Using Jupyter Notebook: Learn how to speak the language of data by extracting useful and actionable insights using Python. Packt Publishing Ltd.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 17.02.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/VPSV/22	**Course name:** Supervision of Student's Scientific Activity

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Supervision of Student's Scientific Activity

Learning outcomes:
By guiding a student within the SOČ or ŠVOČ, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 5

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/VZP/22	**Course name:** Supervisor/consultant of fianl thesis

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Supervisor of the final thesis.

Learning outcomes:
By supervising the final thesis, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ PPC1/22	**Course name:** Teaching activities 1h/s

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 1 semester hour

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PPC2/22	**Course name:** Teaching activities 2h/s
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Direct teaching activity 2 semester hours	
Learning outcomes: Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 6	

abs	n
100.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ PPC3/22	**Course name:** Teaching activities 3h/s

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 6

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Direct teaching activity 3 semester hours

Learning outcomes:
Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PPC4/22	**Course name:** Teaching activities 4h/s
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 8	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Direct teaching activity 4 semester hours	
Learning outcomes: Through pedagogical activity, the PhD student demonstrates the ability to transfer and integrate knowledge from his own field of study into education. He is able to select and apply the right techniques and strategies of study group management, higher education and evaluation of learning outcomes. He is capable of designing and implementing part of the educational process in accordance with current trends in higher education and the requirements placed on the level of communication and digital competencies.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 7	

abs	n
100.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/KZP/22	**Course name:** Thesis consultant

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Final thesis consultant.

Learning outcomes:
By consulting the final thesis, the PhD student demonstrates broad and scientifically based knowledge in the field of study, as well as knowledge of a wide range of methods and approaches. Demonstrates the ability to critically assess a professional problem and its proposed solution, as well as to evaluate it and possibly propose another solution. He applies knowledge and skills from the field of pedagogical sciences to his own field.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ POVK/22	**Course name:** Work in Organizing Committee of Conference
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** distance, present	
Number of ECTS credits: 3	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Work in the organizing committee of the conference	
Learning outcomes: By working in the organizing committee of the conference, the PhD student demonstrates the abilities and competences to organize a scientific or professional event independently or in a team, to manage the implementation in terms of time and content, to communicate effectively verbally and in writing using various technical means as needed, including in a foreign language at a professional level with various types of people, if necessary, correctly recommend solutions or make independent decisions.	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 20	

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100.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. RNDr. Peter Kollár, DrSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/PDS/22	**Course name:** Writing Dissertation Work

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: distance, present

Number of ECTS credits: 20

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Obtaining the required number of credits in the prescribed composition according to the UPJŠ study regulations, preparation and defense of the thesis, successfully completed dissertation examination

Learning outcomes:
The PhD student demonstrated the prerequisites for successful continuation of the study by fulfilling the conditions prescribed by the study regulations for the study and scientific part of the doctoral study related to the topic of the dissertation.

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 27

N	P
3.7	96.3

Provides:

Date of last modification: 08.11.2022

Approved: prof. RNDr. Peter Kollár, DrSc.