CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ ZVPE/17	**Course name:** Basics of Scientific Work and Ethics

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
The evaluation is based on continuous assessment during the semester using a questionaire and task assignments. The credits will be awarded to a student who is successful in each evaluation segment at 60% success rate.

Learning outcomes:
Knowledge: The student will get the overview on basic principles of publishing scientific results including ethical aspects and protection of authorship rights. He/she will have the overview of scientific journals in his/her specialization and is familiar with the review process. He/she knows major domestic and foreign funding agencies and programes.
Skills: The student will gain the ability to publish the results of his/her research results independently or within the team, in a foreign langage, in a position of the main/corresponding author strictly adhering to ethical principles and rules. He/she is able to formulate the research problem and prepare a research grant proposal.
Competencies: The student is able to publish independently or within the team the results of own research in a respected international peer-reviewed journal while adhering to ethical principles and rules. He/she is able to apply for research funding.

Brief outline of the course:
Organizational aspects and methodology of research. Information resources. Writing the research paper. Authorship, rights and protection. Plagiarism and predatory journals. Ethical aspects of research work. Funding agencies and programes. Grant proposal. Presentation of research results – publication, oral presentation, poster.

Recommended literature:
BRENNECKE, P. 2018: Academic Integrity at the Massachusetts Institute of Technology: A Handbook for Students. integrity.mit.edu
BRODRICK, M. 1999: Harvard Medical School Authorship Guidelines. Harvard Medical School, Boston, USA.
GONDA, V. 2002: Doktorandské štúdium a dizertačná práca. Bratislava: Ekonóm.
HENGL, T., GOULD, M. 2006: The unofficial guide for authors (or how to produce research articles worth citing). EUR 22191 EN, 54 pp. Office for Official Publications of the European Communities, Luxemburg.

JARRARD, R. D. 2001: Scientific methods. University of Utah.
Rozhodnutie rektora č. 5/2021 ktorým sa vydávajú zásady dobrej praxe vedeckého publikovania na Univerzite Pavla Jozefa Šafárka v Košiciach a jej súčastiach.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 16

N	P
6.25	93.75

Provides: prof. Mgr. Jaroslav Hofierka, PhD.

Date of last modification: 08.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ CZC/22	**Course name:** Citation in a foreign scientific journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Obtained citation in a foreign scientific journal.	
Learning outcomes: Obtaining a citation demonstrates broad and very well-founded scientific knowledge in the researched field, based on the ability to formulate research questions, to reflect on a scientific problem in such a way that generates new knowledge. At the same time, a citation in an indexed source demonstrates the competence to communicate new knowledge, which is a significant contribution to scientific knowledge, at the highest expert level.	
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. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ CM/22	**Course name:** Citation in a monograph
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 8	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Obtained citation registered in SCI or Scopus.	
Learning outcomes: Obtaining a citation demonstrates broad and very well-founded scientific knowledge in the researched field, based on the ability to formulate research questions, to reflect on a scientific problem in such a way that generates new knowledge. At the same time, a citation in an indexed source demonstrates the competence to communicate new knowledge, which is a significant contribution to scientific knowledge, at the highest expert level.	
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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ CDC/22	**Course name:** Citation in domestic scientific journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: Citation in a national scientific journal	
Learning outcomes: Obtaining a citation demonstrates broad and very well-founded scientific knowledge in the researched field, based on the ability to formulate research questions, to reflect on a scientific problem in such a way that generates new knowledge. At the same time, a citation in an indexed source demonstrates the competence to communicate new knowledge, which is a significant contribution to scientific knowledge, at the highest expert level.	
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. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ SCI/22	**Course name:** Citation registered in the SCI or Scopus database

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

Number of ECTS credits: 8

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:
Obtained citation registered in SCI or Scopus.

Learning outcomes:
Obtaining a citation demonstrates broad and very well-founded scientific knowledge in the researched field, based on the ability to formulate research questions, to reflect on a scientific problem in such a way that generates new knowledge. At the same time, a citation in an indexed source demonstrates the competence to communicate new knowledge, which is a significant contribution to scientific knowledge, at the highest expert level.

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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ MZD/17	**Course name:** Data Collection Methods for GIS

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
The subject consists of direct teaching, practical activities, self-study and individual consultations. Direct teaching makes up 10% of the total teaching. The implementation of practical activities is 40%, 40% is allocated for self-study based on professional literature. 10% of teaching consists of individual consultations to address the topic of the dissertation. The student completes the course if he presents an overview of methods used for the collection of geodata, their import into the database and geographic information system on the basis of published in scientific journals, which are related to the issues of his dissertation.

Learning outcomes:
Knowledge: Based on self-study of scientific publications, the student will gain an overview of the methods used for the collection of geodata, their preparation and import into GIS, which are related to the issues of his dissertation. They will also get acquainted with the cutting-edge technologies of primary and secondary data collection and create an overview of current trends in the collection of massive data for GIS.
Skills: The key skill is the application of theoretical concepts and the design of methodological procedures and technologies for the collection of spatial data and their implementation in a GIS database.
Competences: The graduate of the course is able to design a method of geodata collection and use the cutting-edge geospatial technologies, tools and models with a high degree of independence. Subsequently, it can process massive data independently.

Brief outline of the course:
Methods of primary data collection (geodata): geodetic methods - detailed mapping, GNSS measurements, photogrammetry, ground and aerial laser scanning. Secondary methods of data collection: digitization, entering alphanumeric data. The importance of resources for secondary data collection (state map works, cadastral maps, thematic map works, technical maps, etc.) and their archiving.

Recommended literature:

Course language:

Notes:

Course assessment Total number of assessed students: 9	
N	P
0.0	100.0
Provides: doc. RNDr. Ján Kaňuk, PhD.	
Date of last modification: 23.11.2021	
Approved: prof. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ DMR/22	**Course name:** Digital Terrain Models

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
The assessment is based on continuous checking during the direct teaching part by control questions and assignments for self-training. Students are awarded with the credits in the final assessment if the student achieves the level of mark E or better.

Learning outcomes:
Knowledge: Knowledge of data collection and processing methods for the creation of digital models of georelief (digital elevation models, DEM) or canopy surface (DSM); about the basic theoretical and methodological principles of geomorphometry, including the derivation of morphometric parameters and their applications in practice (especially the slope, orientation and curvature of the georelief, relative height, depth and length of the slopes, horizontal and vertical fragmentation of the relief). Furthermore, knowledge of the analysis of the spatial and hierarchical structure of the georelief, including (derivation of important lines such as valleys, falls, distribution points, pools and their orders, hierarchy of forms, base and residual surfaces, elementary relief forms).
Skills: Mastering methods of creating digital relief models, methods of deriving geomorphometric parameters and identification of georelief forms. The use of different interpolation methods for relief modeling and in the evaluation of the quality of interpolation and models. Time series processing of georelief models in the form of a space-time cube in GIS.
Competences: The ability to appropriately choose a procedure for the derivation of digital georelief models and the calculation of basic and specific geomorphometric parameters. The ability to appropriately visualize the outputs of geomorphometric analyzes in the form of static and dynamic forms of visualization.

Brief outline of the course:
1. Geomorphometry and its definition, the meaning of geomorphometry and its basic methodological principles.
2. Digital relief models based on triangular networks and a raster data model. Data sources for creating relief models.
3. Evaluation of interpolation quality and statistical indicators and error propagation in relief modeling.
4. Hierarchical levels of georelief (spatial, temporal) and their reflection in geomorphometry methodology.

5. Expressing the relationship between the geometric structure of the georelief and processes modeling the georelief.
6. Basic morphometric parameters - definition and meaning: slope of the georelief in the direction of gradient curves, orientation of the georelief with respect to the cardinal points, curvature of the georelief, overall geometric forms of the georelief and their classification based on ordered pairs of normal curvatures.
7. Identification and analysis of profiles, important lines and points on the georelief, hypsometric map, relative heights, depth and length of slopes, horizontal and vertical fragmentation, roughness
8. DEM segmentation, identification of georelief forms or land cover objects.
9. Creation of various applied morphometric maps.

Recommended literature:

HENGL, T., REUTER, H.I. (eds) (2008). Geomorphometry: Concepts, Software, Applications. Developments in Soil Science, 33, Elsevier, 772 pp.
FLORINSKY I.V. (2017). An illustrated introduction to general geomorphometry. Progress in Physical Geography: Earth and Environment. 2017;41(6):723-752.
MINÁR, J., EVANS, I.S., JENČO, M. (2020). A comprehensive system of definitions of land surface (topographic) curvatures, with implications for their application in geoscience modelling and prediction. Earth-Science Reviews, 211, 103414.
SOFIA, G., ELTNER, A., NIKOLOPOULOS, E., CROSBY, C. (2019). Leading Progress in Digital Terrain Analysis and Modeling. ISPRS International Journal of Geo-Information. 2019; 8(9):372.
CARRERA-HERNÁNDEZ, J.J. (2021). Not all DEMs are equal: An evaluation of six globally available 30 m resolution DEMs with geodetic benchmarks and LiDAR in Mexico. Remote Sensing of Environment, 261, 112474.
GALLAY, M., 2015: Digitálne modelovanie reliéfu v open-source GIS. Vysokoškolské učebné texty. Prírodovedecká fakulta UPJŠ v Košiciach, 118 s.
KRCHO, J., 1990: Morfometrická analýza a digitálne modely georeliéfu. Veda, Bratislava.
PETRASOVA A, HARMON B, PETRAS V, TABRIZIAN P, MITASOVA H., 2018, Tangible Modeling with Open Source GIS. Second edition. Springer International Publishing. p. 183.
HLÁSNY, T. 2007: Geografické informačné systémy - Priestorové analýzy. Zephyros& Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen.
MITÁŠOVÁ, H., 2019. Dynamic Landscape modelling, Workshop Kosice 2019: https:// sites.google.com/ncsu.edu/kosice2019/home
HARMON, B.A., MITASOVA, H., PETRASOVA, A., PETRAS, V., 2019: R.sim.terrain 1.0: A landscape evolution model with dynamic hydrology. Geoscientific Model Development, 12 (7), pp. 2837-2854.
HOFIERKA, J., KAŇUK, J., GALLAY, M., 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach, p. 192 KAŇUK, J., 2015: Priestorové analýzy a modelovanie. Vysokoškolské učebné texty. Prírodovedecká fakulta UPJŠ v Košiciach, 106 s.
LYONS, N.J., STAREK, M.J., WEGMANN, K.W., MITASOVA, H., 2015. Bank erosion of legacy sediment at the transition from vertical to lateral stream incision. Earth Surface Processes and Landforms, 40 (13), pp. 1764-1778.

Course language:
Slovak or English

Notes:

Course assessment Total number of assessed students: 0	
N	P
0.0	0.0
Provides: doc. Mgr. Michal Gallay, PhD.	
Date of last modification: 12.07.2022	
Approved: prof. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PPC1/22	**Course name:** Direct pedagogical activity 1 semester hour
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ PPC2/22	**Course name:** Direct pedagogical activity 2 semester-hours

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ PPC4/22	**Course name:** Direct pedagogical activity 4 semester-hours

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 5

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ PPC3/22	**Course name:** Direct teaching activity 3 semester-hours

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ ODIP/17	**Course name:** Dissertation and its defence

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 6

N	P
0.0	100.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/DK/22	**Course name:** Domestic conference

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ DKZU/22	**Course name:** Domestic conference with foreign participation

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/DC/22	**Course name:** Domestic journal

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PDS/22	**Course name:** Elaboration and defence of the thesis, successful completion of the dissertation examination
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 20	
Recommended semester/trimester of the course:	
Course level: III.	
Prerequisities:	
Conditions for course completion: The dissertation examination consists of two parts - defence of the written thesis for the dissertation examination and oral examination from 3 subject areas/subjects, the compulsory subject is Geoinformatics and the student selects another two from three elective subject depending on passed subjects during the study and his/her profile. The elective subjects are: 1. Geographic Information Systems, 2. Remote Sensing, 3. Geographic Cartography. The examination committee evaluates the answers. The written thesis for the dissertation examination is prepared under the supervision of the doctoral supervisor and Study regulations for doctoral study programes at UPJŠP, where the student can found all the details regarding dissertation examination, submission and defence of the written thesis.	
Learning outcomes: The student will demonstrate the systematic and complete knowledge from the theory and methodology of Geoinformatics and Remote Sensing and demonstrate the ability to formulate research goals depending on the topic of the dissertation thesis. By written thesis for the dissertation examination, the student demonstrates the ability to collect, analyze and evaluate theoretical and practical knowledge and solve the assigned tasks.	
Brief outline of the course:	
Recommended literature: WILSON, J. P., FOTHERINGHAM, A. S. 2008: The Handbook of Geographic Information Science. Blackwell Publishing. LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 2001: Geographic Information Systems and Science. John Wiley & Sons. HOFIERKA, J., KAŇUK, J., GALLAY, M. 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach. LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 1999: Geographical Information Systems: Principles, Techniques, Management and Applications. John Wiley & Sons. DE SMITH, M., J., GOODCHILD, M.F., LONGLEY, P.A. 2015: Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools. http://www.spatialanalysisonline.com/HTML/index.html	

NETELER, M., MITASOVA, H. 2004: Open Source GIS: A GRASS GIS Approach. Second Edition. Boston: Kluwer Academic Publisher.
GROVES, P., 2008: Principles of GNSS, Inertial, and Multisensor Integrated Navigation Systems. London: Artech House, 2008, 536s., ISBN: 9781580532556.
JENSEN, R. J. 2005: Remote Sensing: An Earth Resource Perspective,New Jersey, USA (PrenticeHall).
LEICK,A., 1995: GPS Satellite Surveying. Second edition. New York: John Wiley & Sons, Inc., 1995, 560p., ISBN 0-471-30626-6.
LILLESAND, KIEFER, CHIPMAN, 2008: Remote Sensing and Image Interpretation, New York, USA(Wiley).
SEDLÁK,V., LOŠONCZI,P. A PODLESNÁ,I., 2009: Družicové navigačné systémy. VŠBM Košice (vyd.), Košice, 2009, 75s., (ISBN: 978-80-89282-31-9).
VOSSELMAN, G.& MASS, H. G., 2010: Airborne and terrestrial laser scanning. 1 edition. Boca Raton: CRC Press, 2010. ISBN 978-143-9827-987.
ROBINSON, A. H. et al. 1995: Elements of Cartography. Wiley&sons. 674 s.
VOŽENÍLEK, V., KAŇOK, J., 2011: Metody tematické kartografie. Univerzita Palackého Olomouc, 216 s.
KATUŠČÁK, D.: Ako písať vysokoškolské a kvalifikačné práce. Ako písať seminárne práce, ročníkové práce, práce ŠVOČ, diplomové práce, záverečné a atestačné práce a dizertácie. Bratislava: Stimul, 1998.ISBN 80-85697-57-2.
Smernica k príprave a priebehu obhajoby dizertačnej práce, PF UPJŠ Košice

Course language:
English

Notes:

Course assessment
Total number of assessed students: 3

N	P
0.0	100.0

Provides:

Date of last modification: 09.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ VPZP/22	**Course name:** Elaboration of the opponent's opinion on the final thesis

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 10

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ZC/22	**Course name:** Foreign journal

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ GNSS/22	**Course name:** GNSS and Remote Sensing Methods
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: 10	
Recommended semester/trimester of the course: 1.	
Course level: III.	
Prerequisities:	
Conditions for course completion: The assessment is based on continuous checking during the direct teaching part by control questions and assignments for self-training. Students are awarded with the credits in the final assessment if the student achieves the level of mark E or better.	
Learning outcomes: Knowledge: Theoretical knowledge from selected chapters of global navigation satellite systems (GNSS) and remote sensing of the Earth, overview of current GNSS technology and RS methods in geoscience research. Knowledge of important and relevant journal publications and sources of information on GNSS and RS contemporary issues . Overview in methods of classification of multispectral images and lidar data. Skills: Ability to operate a GNSS geodetic receiver for the purpose of targeting control points or determining the location of objects in the country with its own reference station and using the SKPOS network. Processing of multispectral data, performing image classification, its validation. Ability to process cloud of points from aerial photometrametry. Competencies: Ability to find suitable GNSS methods for mapping and locating objects in the country. Furthermore, the ability to appropriately use RS methods and the data obtained by them according to the purpose of use in geographic applications and to validate the obtained results.	
Brief outline of the course: The latest trends in the use of GNSS in geographic research. High-precision position measurements using RTK - principles and applications. Use of GNSS in the research of processes in the country. Hyperspectral data processing, landscape feature analysis, change detection. Methods of classification of image records. Global and regional spatial databases derived by DPZ methods. New trends in the RS. Collection and processing of data from satellite multispectral scanning, data processing from aerial laser scanning, filtering and classification of lidar points and creation of 3D landscape models. Methods of recording landscape dynamics using RS.	
Recommended literature:	
Course language:	
Notes:	

Course assessment Total number of assessed students: 2	
N	P
0.0	100.0
Provides: doc. Mgr. Michal Gallay, PhD.	
Date of last modification: 12.07.2022	
Approved: prof. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ MGEO/22	**Course name:** Geoscientific research methods

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: 10

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
The grading is based on continuous control during the semester in the form of control questions and tasks for independent work. In addition to lectures, the course also includes self-study of recommended literature and consultations. To get credits, the student has to who achieve at least 50% (grade E) of evaluation during the semester.

Learning outcomes:
Knowledge: Students demonstrate a thorough understanding of selected theoretical concepts and related geoscience research methods related, with a focus on methods that can be applied using geographic information systems.
Skills: The students can digitally process and analyse the features and components of the landscape using selected methods, for example, special methods of field research, landscape monitoring, create time series characterizing the development of state variables in order to analyse the structure and dynamics of changes in the landscape. Students can collect relevant field data, apply it to a suitable open source GIS, analyse and correctly interpret the results. Students can innovatively use social and economic data and quantitative methods used in human geography to analyse the anthropogenic components of the landscape and their changes over time, to formulate research hypotheses and to model forecasts of the development of the region, or apply them in the research of relationships and interactions in the region.
Competences: Students are capable of conducting independent research in a specific area of geography, are able to identify appropriate and up-to-date methods and then to apply them and, based on their outputs, logically and consistently draw scientifically relevant conclusions.

Brief outline of the course:
Methods of research of the natural component of the landscape.
Selected methods of field research of the landscape and monitoring.
Geoecological research.
Mapping and identification of landscape changes using selected geospatial technologies.
Analysis of the spatio-temporal structure of the region.
Qualitative and quantitative methods in human geography.
Formulation of research hypotheses, application of statistical methods.
Modeling and forecasting in human geography.

Recommended literature:

BENZON, N., HOLTON, M., WILKINSON, C., WILKINSON, S. (eds.), 2021: Creative Methods for Human Geographers. London (Sage).
DOSTÁL, P. (ed.), 2008: Evolution of Geographical Systems and Risk Processes in the Global Context. Prague: UK, 171 p.
DOSTÁL, P., LANGHAMMER, J. (eds), 2007: Modelling Natural Environment and Society. Prague: UK, 283 p.
GOMEZ, B., JONES, J. P., 2010: Research Methods in Geography. Blackwell Publishing.
HAY, I., COPE, M. (eds.), 2021: Qualitative Research Methods in Human Geography (5th edition). Oxford (Oxford University Press).
HOFIERKA, J., KAŇUK, J., GALLAY, M., 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach, 192 p.
HUNTER, R., 2017: GIS applications in human geography. Oxford Bibliographies in Geography. Retrieved from: https://goo.gl/GrDxgJ.
LANGFORD, M., 2006: Obtaining population estimates in non-census reporting zones: an evaluation of the 3-class dasymetric method. Computers, Environment and Urban Systems 30(2), 161-180.
LLOYD, CH., 2009: Spatial Data Analysis. An Introduction for GIS users. Oxford University Press, Oxford.
MINÁR, J. et al., 2001: Geoekologický (komplexný fyzickogeografický) výskum a mapovanie vo veľkých mierkach. Geografické spektrum, 3, Bratislava.
SPENCER, E. W., 2018: Geologic Maps - A practical guide to preparation and interpretation. Waveland Press, Inc., USA, 1-223.
LISLE, R. J., 2004: Geological Structures and Maps. A practical guide. Elsevier, GB, 1-106.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 2

N	P
0.0	100.0

Provides: doc. Ing. Katarína Bónová, PhD., doc. Mgr. Ladislav Novotný, PhD.

Date of last modification: 06.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ GAM/17	**Course name:** Geospatial Analysis and Modelling

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: 10

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
The subject consists of direct teaching, practical activities, self-study and individual consultations. Direct teaching makes up 10% of the total teaching. The implementation of practical activities is 40%, 40% is allocated for self-study based on scientific literature. 10% of teaching consists of individual consultations to address the topic of the dissertation. The student completes the course if he presents an state-of-the-art of methods used for geospatial analysis and modeling of phenomena published in scientific journals that are related to the issues of his dissertation.

Learning outcomes:
Knowledge: Based on self-study, the student will gain a state-of-the-art of the methods used for geospatial analysis and modeling of phenomena published in scientific journals, which are related to the issues of his dissertation.
Skills: The key skill of the graduate is the application of formalized models in the environment of a geographic information system, the creation of development scenarios, evaluation of results and their application in practice.
Competences: The graduate of the course is able to use the most modern geospatial technologies, tools and models with a high degree of independence and can process large data files on the territory. By applying models, he can analyze the relationships between components of the country, regions and model their further development.

Brief outline of the course:
Conceptual and digital representation of the landscape. Advanced mathematical and statistical methods for the analysis of geospatial phenomena. Formalization of spatial interaction models. Implementation of models in GIS. Validation. Applications in practice.

Recommended literature:
DE SMITH, M., J., GOODCHILD, M.F., LONGLEY, P.A. 2015: Geospatial Analysis:
A Comprehensive Guide to Principles, Techniques and Software Tools. http://
www.spatialanalysisonline.com/HTML/index.html
HLÁSNY, T. 2007: Geografické informačné systémy - Priestorové analýzy. Zephyros& Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen. 160 s.
HOFIERKA, J., KAŇUK, J., GALLAY, M., 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach, p. 192

KAŇUK, J., 2015: Priestorové analýzy a modelovanie. Vysokoškolské učebné texty. Prírodovedecká fakulta UPJŠ v Košiciach, 106 s.
KAŇUK, J., GALLAY, M., HOFIERKA, J., 2015: Generating time series of virtual 3-D city models using a retrospective approach. Landscape and Urban Planning, 139, pp. 40-53
KUSENDOVÁ, D. 1998. Aplikácia GIS vo vybraných humánno-geografických štúdiách. [GIS application in certain human-geographic studies], Folia Geographica, 1, 177-186.
LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 2001: Geographic Information Systems and Science. John Wiley & Sons.
LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 1999: Geographical Information Systems: Principles, Techniques, Management and Applications. John Wiley & Sons.
LLOYD, CH. 2009: Spatial Data Analysis. An Introduction for GIS users. Oxford University Press, Oxford.
NETELER, M., MITASOVA, H. 2004: Open Source GIS: A GRASS GIS Approach. Second Edition. Boston: Kluwer Academic Publisher.
SHEKHAR, S., XIONG, H. 2008: Encyclopedia of GIS. Springer.
WILSON, J. P., FOTHERINGHAM, A. S. 2008: The Handbook of Geographic Information Science. Blackwell Publishing.

Course language:

Notes:

Course assessment
Total number of assessed students: 17

N	P
0.0	100.0

Provides: doc. RNDr. Ján Kaňuk, PhD.

Date of last modification: 23.11.2021

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/SUS/17	**Course name:** Geospatial Reference Systems

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
The evaluation is based on continuous assessment during the semester using a questionaire and task assignments. The credits will be awarded to a student who is successful in each evaluation segment at 60% success rate.

Learning outcomes:
Knowledge: The student will have the overview on astronomical, terrestrial and orbital coordinate systems with a focus on global and local coordinate systems for Geoinformatics.
Skills: The student will have the ability to make coordinate systems transformations used in current GIS especially using available open-source tools (PROJ library).
Competencies: The student will be able to formulate independently or within the team the requirements on coordinate systems definitions used in GIS projects and propose appropriate software tools for effective and accurate coordinate system transformation for various geospatial data.

Brief outline of the course:
Coordinate systems and their classification. Terrestrial coordinate systems: geocentric and topocentric coordinate systems. Astronomic coordinate systems: geocentric and ecliptical coordinate systems. Orbital coordinate systems: geocentric coordinate systems depending on time. Geodetic coordinate systems and their specifities in collection methods for Geoinformatics and GIS. Current coordinate systems developed by IRES. Specific transformation methods between selected coordinate systems. National coordinate system in Slovakia - SKPOS (Slovenská priestorová observačná služba) and SLOVGERENET (Slovak Geodynamic Reference Network) and their use for Geoinformatics. Coordinate systems used in GIS, thier transformations and available software tools including the PROJ library.

Recommended literature:
BURKHOLDER, E. F., 2001: Spatial Data, Coordinate Systems, and the Science of Measurement. In: Journal of Engineering Surveying, Vol. 127, No. 4, pp.143-156, ISSN: 0733-9453 eISSN: 1943-5428.
FIXEL, J., 2000: Geodetická astronomie I a základy kosmické geodézie. Brno: Vutium, 2000.
HOFMANN-WELLENHOF, B. & MORITZ, H., 2006: Physical Geodesy. 2nd edition, Wien-New York: Spriger, 2006, 420p.

KABELÁČ, J. a KOSTELECKÝ, J., 2001: Geodetická astronomie 10. Praha: ČVUT, 2001.
MARIEN, J., 2009: Astronomy and Geodesy. Charleston: BiblioLife, 2009, 460p., ISBN: 978-1116562088.
SEDLÁK, V. a ŠADERA, M., 1998: Globálna geodézia I. Košice: TU Košice, 1998, 109s., ISBN: 80-88896-20-7.
SEDLÁK,V., 1999: Globálna geodézia II. Košice: TU Košice, 1998, 93s., ISBN: 80-88896-20-7.
SEDLÁK,V., 2001: Transformation procedures in 3D Conventional Coordinate Systems. In: Reports on GEODESY, No.4(59)2001, pp.57-68, Warsaw: Inst. Geodezji Wyzsej i Astronomii Geodezijnej Politechniki Warszawskiej (editor), ISBN 83-85287-2.
SOFFEL, M. & lANGHAUS, R., 2012: Space-Time Reference Systems. Heidelberg-New York-Dordrecht-London: Springer, 2012, ISBN: 978-3-642-30225-1 (print), ISBN: 978-3-642-30226-8 (online).
Source Wikipedia, 2011: Coordinate Systems: Cartesian Coordinate System, Spherical Coordinate System, Abscissa, Polar Coordinate System, Cylindrical Coordinate System. Publisher: Books LLC / Wiki Series, 2011, 72p., ISBN-13: 978-1156431238.
YANG, Q., SNYDER, J. P., TOBLER, W., 2000: Map Projection Transformation: Principles and Application. Taylor & Francis, London, 367p.
PROJ - a generic coordinate transformation software, 2021: https://proj.org/.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 0

N	P
0.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.

Date of last modification: 08.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 5

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ MBLZ/17	**Course name:** Mapping using Unmanned Aerial Vehicles

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
The subject consists of direct teaching, practical activities, self-study and individual consultations. Direct teaching takes place in the Remote Sensing Laboratory, at home institution. Available unmanned aerial systems and accessories, as well as data processing software, are introduced during a lectures. This part makes up 20% of the total teaching. The aim of the course is to teach students to use advanced methods of mapping and data processing using unmanned aerial systems in a selected location of interest. All activities will be performed under the supervision of an authorized person to perform aerial works. The portion for implementation of practical activities in the field is 40% and another 30% is self-study based on professional literature. 10% of teaching consists of individual consultations. The student completes the course if he presents the results obtained from his own measurements. The presentation also includes a discussion with professional literature.

Learning outcomes:
Knowledge: The student will gain advanced knowledge of UAS and sensors for mapping and can identify their potential in geoscience research.
Skills: Under the supervision of a responsible person, the student will perform mapping using unmanned aerial systems and use advanced data processing methods in specialized software.
Competences: The student is able to independently propose a methodology for data collection from UAS, use advanced data processing methods and compare the results with the results of other authors published in scientific journals.

Brief outline of the course:
Categories of unmanned aerial vehicles, technical characteristics and areas of application for landscape mapping. Technology platforms and UAV equipment. Management and control systems. Mission planning and mapping. Data processing. Software for processing photographic records and creating 3D models. Aerial laser scanning using UAV. Laser scanning data processing. Applications in geographic research. Legislative framework for the use of UAVs in Slovakia and abroad

Recommended literature:
ABER, J., MARZOLF, I., RIES, J., 2010: Small-format aerial photography: principles, techniques and geoscience applications. Oxford (Elsevier).

BALTSAVIAS, E., GRUEN, A., EISENBEISS, H., ZHANG, L., WASER, L.T., 2008: High Quality Image Matching and Automated Generation of 3D Tree Models. International Journal of Remote Sensing, 29:5, 1243-1259.
ECK, CH. IMBACH, B. 2011: Aerial magnetic sensing with an uav helicopter. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Vol. XXXVIII-1/C22 UAV-g 2011, Conference on Unmanned Aerial Vehicle in Geomatics, Zurich, Switzerland
ECK, CH. AND GEERING, H. P., 2000: Error dynamics of model based INS/GPS navigation for an autonomously flying helicopter. Proceedings of the AIAA Guidance, Navigation, and Control Conference, Denver, CO, AIAA-2000-4465, pp. 1–9.
EISENBEISS, H., 2011: The Potential of Unmanned Aerial Vehicles for Mapping, Photogrammetrische Woche 2011, Dieter Fritsch (Ed.), Wichmann Verlag, Heidelberg, pp. 135-145.
EISENBEISS, H., SAUERBIER, M., 2011: Investigation of UAV systems and flight modes for photogrammetric applications. The Photogrammetric Record 26 (136): 400-421 (December 2011), doi: 10.1111/j.1477-9730.2011.00657x.
FISCHER, L., EISENBEISS, H., KÄÄB, A., HUGGEL, CH., HAEBERLI, W., 2011: Monitoring topographic changes in periglacial high-mountain faces using high-resolution DTMs, Monte Rosa east face, Italian Alps. Permafrost and Periglacial Processes, Published online in Wiley Online Library(wileyonlinelibrary.com).
LALIBERTE, A. S., RANGO, A., 2011: Image processing and classification procedures for analysis of sub-decimeter imagery acquired with an unmanned aircraft over arid rangelands. GIScience and Remote Sensing, 48, 74-85.
LILLESAND, KIEFER, CHIPMAN, 2008: Remote Sensing and Image Interpretation, New York, USA(Wiley).
SLÁDEK, J., RUSNÁK, M., 2013: Nízkonákladové mikro-UAV technológie v geografii (nová metóda zberu priestorových dát). Geografický časopis, 65 (3), 269-285.
TURNER, D., LUCIEER, A., WATSON, CH., 2012: An automated technique for generating georectified mosaics from ultra-high resolution unmanned aerial vehicle (UAV) imagery, based on structure from motion (SfM) point clouds. Remote Sensing, 4, 1392-1410.
VOSSELMAN, G.& MASS, H. G., 2010: Airborne and terrestrial laser scanning. 1 edition. Boca Raton: CRC Press, 2010. ISBN 978-143-9827-987.
WATTS, A. C., AMBROSIA, V. G., HINKLEY, E. A., 2012: Unmanned aircraft systems in remote sensing and scientific research: classification and consideration of use. Remote sensing, 4, 1671-1692.

Course language:

Notes:

Course assessment
Total number of assessed students: 11

N	P
0.0	100.0

Provides: doc. RNDr. Ján Kaňuk, PhD.

Date of last modification: 23.11.2021

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/POVK/22	**Course name:** Member of organisational conference committee

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 0

abs	n
0.0	0.0

Provides: doc. RNDr. Ján Kaňuk, PhD.

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ SDP/22	**Course name:** Member of the domestic project team
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 6	

abs	n
100.0	0.0

Provides:	
Date of last modification: 08.11.2022	
Approved: prof. Mgr. Jaroslav Hofierka, PhD.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ SIG/22	**Course name:** Member of the internal project team

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 1

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ SMP/17	**Course name:** Member of the international project team
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 3	

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPSV/22	**Course name:** Mentoring a student in the framework of the SOC or Student Scientific Conference
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/NGM/15	**Course name:** Nontraditional geostatistical methods

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To acquaint students with interdisciplinary approaches to solving geostatistical problems based on statistical physics models. Students will get acquainted with methods of predicting spatially-correlated data based on so-called spin models, standardly used in magnetism.

Brief outline of the course:
Geostatistical problems solved by innovative approach, an alternative to conventional geostatistical methods, based on models from statistical physics. Getting familiar with the basic concepts of statistical physics and their application to the physical lattice spin models. Geostatistical data modeled as correlated spatial random fields defined through local interactions - an analogy with statistical-physical spin models. Demonstrating the effectiveness and universality of defined models in the processing of bulky, for example, satellite or radar datasets.

Recommended literature:
PATHRIA, R.K., BEALE P.D. 2007: Statistical Mechanics. Elsevier.
MECKE, K.R. (Ed.), STOYAN D. (Ed.) 2000: Statistical Physics and Spatial Statistics. Springer.
LANDAU, D.P., BINDER. K 2009: A guide to Monte Carlo simulations in statistical physics. Cambridge University Press.
ŽUKOVIČ, M., HRISTOPULOS, D.T. 2009: Classification of missing values in spatial data using spin models. Physical Review E 80 (1) 011116.

Course language:

Notes:

Course assessment
Total number of assessed students: 0

N	P
0.0	0.0

Provides: prof. RNDr. Milan Žukovič, PhD.

Date of last modification: 17.09.2021

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PVSF/22	**Course name:** Patents, inventions, software
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

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: 121

abs	n	neabs
98.35	0.0	1.65

Provides: doc. PaedDr. Renáta Orosová, PhD.

Date of last modification: 14.09.2024

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/RZ/22	**Course name:** Peer-reviewed foreign or domestic proceedings

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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: 5

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/VYS/22	**Course name:** Presentation at the seminar

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ SMID/22	**Course name:** Processing, modelling and interpretation of data in human-geographic research

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
The grading is based on continuous verification of knowledge and skills during the course (which includes lectures, consultations and self-study of the recommended literature) in the form of control questions (1/3 of the evaluation); active participation in the discussion (1/3 of the evaluation) and outputs from the independent work (1/3 of the evaluation). To obtain a grade A, it is necessary to obtain a weighted average of the three parts of the grading of 90% or more, for grade B it is 80%, for grade C 70%, for D 60% and for E 50%. Credits will not be granted to a student who achieves less than 50% in any of the three parts of grading, or does not reach the overall evaluation level of at least 50%. Active participation in classes with max. 2 absences is necessary condition to get a grade.

Learning outcomes:
Knowledge: Students will acquire knowledge about the various nature and sources of data used in human-geographic research. They will get an overview of the possibilities and methods of their primary processing and modeling, as well as an overview of the possibilities of graphic and content interpretation of these data with strong relevance and logical consistency of the conclusions drawn.
Skills: Students are able to critically evaluate the availability and reliability of statistical data of various nature, their relevance and limits in relation to the intended research task. They are capable of adequately primary processing of data. The students are oriented in the available tools for merging and modeling databases in a form corresponding to the needs of the research carried out, as well as being able to evaluate and apply various methods of data interpretation and draw relevant conclusions from them.
Competences: The students are able to conduct independent scientific work based on the processing, modeling and interpretation of human-geographic data.

Brief outline of the course:

Recommended literature:
BRUNDSON, C. 2015: Quantitative methods I: Reproducible research and quantitative geography. Progress in Human Geography, 40, 687-696.
GRAHAM, M., TAYLOR, S. 2013: Geography and the future of bid data, big data nad the future of geography. Dialogues in Human Geography, 3(3), 255-261.
HARVEY, J. M., GOODCHILD, M. F. 2015: Data-driven geography. GeoJournal, 80, 449-461.

KITCHIN, R. 2013: Big data and human geography: Opportunities, challenges and risks. Dialogues in Human Geography, 3(3), 262-267.
WAINWRIGHT, J. 2021: Is Critical Human Geography Research Replicable? Annals of the American Association of Geographers, 111, 1284-1290.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 1

N	P
0.0	100.0

Provides: doc. Mgr. Ladislav Novotný, PhD.

Date of last modification: 06.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PGIS/17	**Course name:** Programming for GIS

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
The evaluation is based on continuous assessment during the semester using a questionaire and task assignments. The credits will be awarded to a student who is successful in each evaluation segment at 60% success rate.

Learning outcomes:
Knowledge: The student will get the overview on current approaches in software modules programming for GIS, especially open-source (GRASS GIS, QGIS) using programing languages such as ANSI C and Python. He/she will have the overview on licencing and approaches in the development of open-source softwares.
Skills: The student will gain the ability to install the software from the source code in Linux operating system including necessary libraries and software modules. He/she will be able to understand the source code in ANSI C and Python and make the modifications of the code to change the functionality of the software module including its installation in the system.
Competencies: The student will be able to work independently or within the team to develop the GIS software , i.e. create and compile GIS software modules, install GIS software and necessary software libraries from the source code (e.g., GDAL, PROJ and other) in Linux operating system.

Brief outline of the course:
Legislative framework and licencing. Principles and approaches for programming for GIS. Comparison of GIS softwares using programming languages and licencing. Levels of module integration in GIS. Software architectures, source code structure, libraries. Installation and compilation in Linux operating system. Examples of implementation in ANSI C, Shellscript and Python. Examples of ready-to-use modules for GRASS GIS. Project of software module development.

Recommended literature:
HOFIERKA, J., LACKO, M:, ZUBAL, S. 2017. Parallelization of interpolation, solar radiation and water flow simulation modules in GRASS GIS using OpenMP. Computers and Geosciences, 2017, 107, 20–27.
NETELER, M., MITASOVA, H., 2008: Open Source GIS: A GRASS GIS Approach. Third Edition. The International Series in Engineering and Computer Science, Volume 773, Springer, New York.

KERNIGHAN, B. W., RITCHIE, D. M. 1988: Programovací jazyk C. Alfa Bratislava.
BURIAN, L., STANKOVÁ, H. 2015: Python pre geovedné aplikácie. Univerzita Komenského Bratislava.
SHEKHAR, S., XIONG, H. 2008: Encyclopedia of GIS. Springer.
LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 1999: Geographical Information Systems: Principles, Techniques, Management and Applications. John Wiley & Sons.
ZAMBELLI, P., GEBBERT, S., CIOLLI, M.: Pygrass: An Object Oriented Python Application Programming Interface (API) for Geographic Resources Analysis Support System (GRASS) Geographic Information System (GIS). ISPRS International Journal of Geo-Information 2, 2013, s. 201–219.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 13

N	P
0.0	100.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.

Date of last modification: 08.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

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.

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: 02.12.2024

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 2

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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:
By publishing in a journal of category Q4 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: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/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: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ VMZI/22	**Course name:** Selected methods of geoscientific data capturing, analysis and their interpretation

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
The grading is based on continuous control during the semester in the form of control questions and tasks for an independent work. In addition to lectures, the course includes self-study of recommended literature and consultations. Credits will be awarded to a student who achieves a grade of at least E (50%) in the final assessment.

Learning outcomes:
Knowledge: The student knows the applications of remote sensing data in the research of the geological bedrock, changes in lithology often indicating the presence of mineral resources, tectonic geological structures, as well as the possibilities of verification of remote sensing data in the field. Skills: The student can identify the basic elements of the geological structure of the territory resulting from the changes in the morphological characteristics of the terrain, the drainage network, the resistance of rocks to weathering, layering and specific spectral characteristics of individual genetic rock types (e.g., alterations), selected types of mineral resources, structures such as the folds, faults, shear zones and lineaments based on remote sensing data. Competences: The student is able to define a specific geological problem that he wants to analyse using remote sensing methods, he can design a suitable methodological procedure for analysis and synthesis, and he can communicate the results of his research.

Brief outline of the course:
The course offers the analytical methods and using remote sensing data for identification of various geological phenomena which are characteristic for individual genetic types of rocks and lithological complexes, for tectonic structures at a meso- and macroscale, as well as the possibility of verification of these data by field and laboratory methods.

Recommended literature:
Gupta, R. P., 2018: Remote sensing geology. Springer, Heidelberger Berlin, Germany, 1-428.
Elhebiry, M. S., Sultan, M., Abu El-Leil, I., Kehew, A. E., Bekiet, M. H., Abdel Shahid, I., ... & Emil, M., 2020: Paleozoic glaciation in NE Africa: field and remote sensing-based evidence from the South Eastern Desert of Egypt. International Geology Review, 62 (9), 1187-1204.
Zumsprekel, H., Prinz, T., 2000: Computer-enhanced multispectral remote sensing data: a useful tool for the geological mapping of Archean terrains in (semi) arid environments. Computers & Geosciences, 26 (1), 87-100.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 0

N	P
0.0	0.0

Provides: doc. Ing. Katarína Bónová, PhD.

Date of last modification: 07.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ JSD/22	**Course name:** Spring School for Doctoral Students
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course:	
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: 0	

abs	n
0.0	0.0

Provides:
Date of last modification:
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ZSP1/22	**Course name:** Study abroad for less than 30 days

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ ZSP2/22	**Course name:** Study abroad for more than 30 days
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** 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: 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: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 08.11.2022
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ TMG/22	**Course name:** Theory and Methodology in Geoinformatics

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: 10

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
The evaluation is based on continuous assessment during the semester using a questionaire and task assignments. The credits will be awarded to a student who is successful in each evaluation segment at 60% success rate.

Learning outcomes:
Knowledge: The student will have the overview on metascience and interdisciplinary aspects of geoinformatics as well as further development in this field of science. Based on the current knowledge and paradigms in this field, he/she will acquire a deep understanding of theoretical aspects in geoinformatics and geographic information systems with cutting-edge knowledge, methods and applications using self-study activities, literature review and managed scientific discussions.
Skills: The student will gain the ability to analyze scientific problem, determine the theoretical framework and formulate concrete methodological steps for a solution using the newest scientific knowledge. He/she is able to present the proposed solution in a discussion of experts and in comparison with other, alternative solutions.
Competencies: The student is able to participate independently or within the team on research activities while exhibiting independent and critical thinking based on deep knowledge of the problem, literature and own research. He/she is able of critical thinking and evaluation of own research results or other researchers and formulate further steps, solutions including various alternatives.

Brief outline of the course:
Metageographic aspects of Geoinformatics as an independent field of science. Theoretical and methodological tools of Geoinformatics in solution problems of landscape. Geoinformatics literature. Analysis of current publications (monographs, papers). Critical analysis of scientific works, interpretation and formulation of conclusions. Formulation of a research problem and methodological steps, selection of methods, data and tools. New methods for geospatial adata collection and their influence on methods of processing in GIS, specifics of natural and human phenomena modeling in GIS. Mathematical and numerical methods. The influence of technological component of infrastructure on the development of new geospatial methods. Communication and publication in a network environment. Summary of the latest trends in the Geoinformatics research.

Recommended literature:

HOFIERKA, J., 2012: Geoinformatika ako interdisciplinárna vedná oblasť a jej vzťah ku geografii. Geografický časopis, 63, s. 345-355.
HOFIERKA, J., KAŇUK, J., GALLAY, M., 2014: Geoinformatika. Univerzita Pavla Jozefa Šafárika v Košiciach, p. 192
HLÁSNY, T. 2007: Geografické informačné systémy - Priestorové analýzy. Zephyros& Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen.
LAMPART, M., HORÁK, J., IVAN I. 2013: Úvod do dynamických systemů: teorie a praxe v geoinformatice. Vysoká škola báňská-Technická univerzita Ostrava.
LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 2001: Geographic Information Systems and Science. John Wiley & Sons.
LONGLEY, P. A., GOODCHILD, M. F., MAGUIRE, D. J., RHIND, D. W. 1999: Geographical Information Systems: Principles, Techniques, Management and Applications. John Wiley & Sons.
NETELER, M., MITASOVA, H., 2008: Open Source GIS: A GRASS GIS Approach. Third Edition. The International Series in Engineering and Computer Science, Volume 773, Springer, New York.
PETRASOVA, A., HARMON, B., PETRAS, V., TABRIZIAN, P., MITASOVA, H., 2018: Tangible modeling with Open Source GIS. Cham, Springer.
SHEKHAR, S., XIONG, H. 2008: Encyclopedia of GIS. Springer.
WILSON, J. P., FOTHERINGHAM, A. S. 2008: The Handbook of Geographic Information Science. Blackwell Publishing.

Course language:
English

Notes:

Course assessment
Total number of assessed students: 2

N	P
0.0	100.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.

Date of last modification: 08.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ 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: 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: 1

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/VZP/22	**Course name:** Thesis mentoring

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

abs	n
100.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/NRZ/22	**Course name:** Unreviewed foreign or domestic proceedings

Course type, scope and the method:
Course type:
Recommended course-load (hours):
Per week: Per study period:
Course method: 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: 0

abs	n
0.0	0.0

Provides:

Date of last modification: 08.11.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ WGIS/17	**Course name:** WebGIS and Interoperability of Geographic Information

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
The subject consists of direct teaching, practical activities, self-study and individual consultations. Direct teaching makes up 10% of the total teaching. The implementation of practical activities is 40%, 40% is allocated for self-study based on scientific literature. 10% of teaching consists of individual consultations to address the topic of the dissertation. The student completes the course if he / she presents an environment for data visualization using a web portal, which is related to the issues of his dissertation.

Learning outcomes:
Knowledge: Gaining knowledge and skills to create an interactive web portal publishing geospatial data.
Skills: Working with different types of geodata and designing an online tool for the presentation of geodata in an online environment.
Competences: The graduate of the course is able to use existing opportunities for visualization of geodata in the online environment with a high degree of independence. At the same time, he can independently use innovative methods of dynamic cartographic visualization.

Brief outline of the course:
Basic terminology and definitions, History of the Internet and its impact on GIS, standards of distributed GIS Servers, GML, Web applications and services (WMS, WFS); Web server (APACHE), Map server, client part of the map server (OpenLayers, GeoExt, Ext JS), Geodata storage and sharing them. Spatial DBMS, ESDA, Data Format and Libraries - GDAL, OGR; ASCII

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

N	P
16.67	83.33

Provides: doc. RNDr. Ján Kaňuk, PhD.
Date of last modification: 23.11.2021
Approved: prof. Mgr. Jaroslav Hofierka, PhD.