CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ AUDZ/17	**Course name:** Active participation in domestic international 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: 5	
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: 17

abs	n
100.0	0.0

Provides: doc. RNDr. Ján Kaňuk, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ AUDK/17	**Course name:** Active participation in domestic 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: 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: 9

abs	n
100.0	0.0

Provides:
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ AUZK/17	**Course name:** Active participation in foreign 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: 10	
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: 10	

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPDK/17	**Course name:** Article in domestic Current Contents 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: 15	
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: 1

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPDN/17	**Course name:** Article in domestic non-CC (peer-reviewed) 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: 5	
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: 10	

abs	n
100.0	0.0

Provides: doc. RNDr. Ján Kaňuk, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPZK/17	**Course name:** Article in foreign Current Contents 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: 20	
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: 17

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPZN/17	**Course name:** Article in foreign non-CC (peer-reviewed) 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: 10	
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: 6	

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

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: 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 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: 15

N	P
6.67	93.33

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/ CZVC/17	**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: 10	
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: 12

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/CMON/17	**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: 20	
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: 4

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ CDVC/17	**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: 5	
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: 10

abs	n
100.0	0.0

Provides: doc. RNDr. Ján Kaňuk, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ CSCI/17	**Course name:** Citation registered in the Web of Science 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: 20	
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: 37

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PPC/17	**Course name:** Course teaching
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: 70

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD., prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 29.09.2016
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: 8	
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/17	**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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 13	

N	P
0.0	100.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 19.11.2021
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ DS/17	**Course name:** 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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 10

N	P
0.0	100.0

Provides:
Date of last modification: 05.10.2016
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: 4

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

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

Learning outcomes:
The development of students´ language skills - reading, writing, listening, speaking, improvement of their linguistic competence - students acquire knowledge of selected phonological, lexical and syntactic aspects, development of pragmatic competence - students can efectively use the language for a given purpose, with focus on Academic English and English for specific/professional purposes, level B2.

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

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

Course language:
English, level B2 according to CEFR

Notes:

Course assessment
Total number of assessed students: 738

N	Ne	P	Pr	abs	neabs
0.0	0.0	48.1	0.0	51.9	0.0

Provides: PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 16.09.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

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

Course assessment
Total number of assessed students: 729

N	Ne	P	Pr	abs	neabs
0.27	0.0	93.83	1.1	4.8	0.0

Provides: PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD.

Date of last modification: 10.03.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ AZSP/17	**Course name:** Foreign study stay
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:	
Learning outcomes:	
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: doc. Mgr. Michal Gallay, PhD., prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ GNSS/17	**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: 15

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 RS 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:
PETROPOULOS, G., SRIVASTAVA, P. (2021). GPS and GNSS Technology in Geosciences. Elsevier, 466 s.

GALLAY, M., KAŇUK, J., HOCHMUTH, Z., MENEELY, J., HOFIERKA, J., SEDLÁK, V. (2015): Large-scale and high-resolution 3-D cave mapping by terrestrial laser scanning: a case study of the Domica Cave, Slovakia. International Journal of Speleology. 44(3), 277-291.
GROVES, P., 2008: Principles of GNSS, Inertial, and Multisensor Integrated Navigation Systems. London: Artech House, 2008, 536s., ISBN: 9781580532556.
HEFTY, J. A HUSÁR, L., 2008: Družicová geodézia. Globálny polohový systém. Bratislava: STU Bratislava, 2008, 186s., ISBN: 8022728072.
JENSEN, R. J. 2005: Remote Sensing: An Earth Resource Perspective,New Jersey, USA (PrenticeHall).
LILLESAND, KIEFER, CHIPMAN, 2008: Remote Sensing and Image Interpretation, New York, USA(Wiley).
DOWMAN, I., JACOBSEN K., KONECNY, G., SANDAU, R., 2012: High Resolution Optical Satellite Imagery. Whittles Publishing; 1 edition,256 p. ISBN: 978-1439894446.
EISMANN, M. T., 2012: Hyperspectral Remote Sensing, 748 p., Volume: PM210, ISBN: 9780819487872
SEDLÁK, V., 2019. Globálne navigačné satelitné systémy pre geoinformatiku. Košice: Univerzita P. J. Šafárika v Košiciach, ISBN 978-80-8152-770-8.
VOSSELMAN, G.& MASS, H. G., 2010: Airborne and terrestrial laser scanning. 1 edition. Boca Raton: CRC Press, 2010. ISBN 978-143-9827-987.

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 16

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/ 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: 16

N	P
0.0	100.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD., 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:

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/ZIG/17	**Course name:** Getting funding for internal 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: 10	
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: 3

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VUVS/17	**Course name:** Institute seminar presentation
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: 5

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 01.10.2016
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: 10

N	P
0.0	100.0

Provides: doc. Mgr. Michal Gallay, PhD., 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/17	**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: 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: 12

abs	n
100.0	0.0

Provides:
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ SDP/17	**Course name:** Member of the domestic project team (APVV, VEGA, KEGA,...)
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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 26

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 01.10.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ SIG/17	**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: 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: 4	

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 01.10.2016
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/ VSVK/17	**Course name:** Mentoring Student Scientific Conference publication
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:	
Learning outcomes:	
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: 29.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ MGV/17	**Course name:** Methods of Geographic Research
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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 16

N	P
0.0	100.0

Provides: doc. Ing. Katarína Bónová, PhD., doc. Mgr. Ladislav Novotný, PhD.
Date of last modification: 28.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPNZ/17	**Course name:** Non peer-reviewed article in 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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 12

abs	n
100.0	0.0

Provides: doc. Mgr. Michal Gallay, PhD.
Date of last modification: 01.10.2016
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: ÚINF/ PADS/17	**Course name:** Parallel and Distributed 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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

N	P
0.0	0.0

Provides: doc. RNDr. Jozef Jirásek, PhD.
Date of last modification: 28.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ PAVS/17	**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: 10	
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: prof. Mgr. Jaroslav Hofierka, PhD.	
Date of last modification: 02.10.2016	
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: 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:
Students will be able to:
Apply didactic principles, methods, forms, and tools in the teaching of a specialised subject. Specify the educational procedures of a university teacher in subject teaching, pedagogical diagnostics, evaluation of learning outcomes, and self-reflection. Present rationalisation and streamlining possibilities in the teaching of specialised subjects. Apply educational competencies of university teachers taking into account the peculiarities of educating 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:
Čapek, R. (2015). Moderní didaktika. Lexikon výukových a hodnoticích metod. Praha, Grada Publishing, a.s.
Danek, J. (2014). Pedagogická komunikácia na vysokej škole. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Dargová, J. (2001). Tvorivé kompetencie učiteľa. Prešov, Privat Press.
Dvořáček, J. (2014). Základy pedagogiky. Praha, Oeconomica.
Hupková, M., Petlák, E. (2004). Sebareflexia a kompetencie v práci učiteľa. Bratislava, IRIS.
Kyriacou, CH. (1996). Klíčové dovednosti učitele. Praha, Portál.
Mertin, V. a kol. (2012). Metody a postupy poznávaní žáka: pedagogická diagnostika. Praha, Wolters Kluwer.
Petty,G. (2013). Moderní vyučování. Praha, Portál.

Prucha, J. (2013). Moderní pedagogika. Praha, Portál.
Sirotová, M. (2014). Vysokoškolský učiteľ v edukačnom procese. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Slávik, M. a kol. (2012). Vysokoškolská pedagogika. Praha, Grada.
Šebeň Zaťková, T. (2014). Úvod do vysokoškolskej pedagogiky. Trnava, Univerzita sv.Cyrila a Metoda v Trnave.
Turek, I. (2014). Didaktika. Bratislava, Wolters Kluwer, s.r.o.
Zormanová, L. (2014). Obecná didaktika. Praha, Grada.

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 78

abs	n	neabs
98.72	0.0	1.28

Provides: doc. PaedDr. Renáta Orosová, PhD.

Date of last modification: 07.09.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VPRZ/17	**Course name:** Peer-reviewed article in 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:	
Learning outcomes:	
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: doc. Ing. Katarína Bónová, PhD.
Date of last modification: 01.10.2016
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: 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 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: 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 can:
and Understand, summarize and explain selected psychological knowledge from cognitive psychology, emotion and motivation psychology, personality psychology, developmental, social, educational psychology and health psychology.
b) apply the above psychological knowledge necessary for the professional, competent performance of university teaching practice of doctoral students
c) to create and implement the teaching of a professional topic with applied psychological knowledge
d) evaluate their performance and the performance of their classmates, provide 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: 70

abs	n	neabs
100.0	0.0	0.0

Provides: PhDr. Anna Janovská, PhD.

Date of last modification: 24.06.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ SOI/17	**Course name:** Software engineering
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:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

N	P
0.0	0.0

Provides: prof. RNDr. Gabriel Semanišin, PhD.
Date of last modification: 28.09.2016
Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ TMG/17	**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: 15

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 of this field of science. Based on the current knowledge and paradigms in this field, he/she will acquire a deep understanding of theoretical aspects of geoinformatics and geographic information systems with cutting-edge knowledge, methods and applications using self-study activities, literature review and controlled scientific discussions.
Skills: Študent sa získa schopnosť analyzovať vedecký problém, určiť jeho teoretický rámec a formulovať konkrétny metodický postup riešenia s využitím najnovších vedeckých poznatkov. Navrhnuté riešenie vie prezentovať v odbornej diskusii a v konfrontácii s alternatívnymi postupmi.
Competencies: Absolvent je schopný samostatne alebo v tíme participovať na vedeckovýskumnej činnosti pričom sa vyznačuje nezávislým a kritickým myslením, ktoré sa opiera o hlboké znalosti problému na báze vedeckej literatúry a vlastného výskumu. Má schopnosť kriticky analyzovať výsledky vlastného alebo cudzieho výskumu a formulovať ďalší postup riešenia alebo jeho alternatívy.

Brief outline of the course:

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:

Notes:

Course assessment
Total number of assessed students: 16

N	P
0.0	100.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.

Date of last modification: 05.07.2022

Approved: prof. Mgr. Jaroslav Hofierka, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚGE/ VZP/17	**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: 5	
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: 20	

abs	n
100.0	0.0

Provides: prof. Mgr. Jaroslav Hofierka, PhD.
Date of last modification: 29.09.2016
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: prof. Mgr. Jaroslav Hofierka, PhD., doc. RNDr. Ján Kaňuk, PhD.
Date of last modification: 23.11.2021
Approved: prof. Mgr. Jaroslav Hofierka, PhD.