

DESCRIPTION OF THE COURSE OF STUDY

Course code	0521-20S-B04-GIS	
Name of the course in	Polish	GIS
	English	GIS (Geographic Information Systems)

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	environmental Protection
1.2. Mode of study	stationary / extramural
1.3. Level of study	Second - Master's Degree
1.4. Profile of study*	general academic
1.5. Person/s preparing the course description	Grzegorz Walek PhD
1.6. Contact	grzegorz.walek@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	Polish
2.2. Prerequisites*	Basic computer skills

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lecture, laboratory
3.2. Place of classes	Classes in the classrooms of the Jan Kochanowski University
3.3. Form of assessment	Credit with grade
3.4. Teaching methods	Lecture, and with the use of a computer: blended learning (work with the program with the support of the teacher, tasks to be solved), demonstration, discussion.
3.5. Bibliography	Required reading
	Further reading

Longley P.A., Goodchild M.F., Maguire D.J., Rhind D.W., 2006, GIS. Teoria i praktyka. PWN W-wa.
 Urbański J., 2008, GIS w badaniach przyrodniczych. Wyd. UG, Gdańsk.
 Szczepanek R., 2017, Systemy informacji przestrzennej z QGIS: podręcznik akademicki. Cz. 1 i 2. Wydawnictwo PK, Kraków.
 De Smith M.J., Goodchild M.F., Longley P.A., 2018, Geospatial Analysis, a Comprehensive Guide to Principles, Techniques and Software. 6th Edition.
 Zwoliński Z. (red.), 2009, GIS - platforma integracyjna geografii, Bogucki Wydawnictwo Naukowe, Poznań.
 Pieniążek M., Szejgiec B., Zych M., Ajdyn A., Nowakowska G., 2014, Graficzna prezentacja danych statystycznych. Główny Urząd Statystyczny, Warszawa. (dostępne online)
 Gotlib D., Olszerwski R., 2016, Smart City. Informacja przestrzenna w zarządzaniu inteligentnym miastem. Wydawnictwo Naukowe PWN.
 Van Maarseveen, Martines J., Flacke J., 2019, GIS in Sustainable Urban Planning. CRC Press.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

<p>4.1. Course objectives (including form of classes)</p> <p>Lecture: C1. Obtaining knowledge about geographic information systems and the possibilities of their application in environmental analyzes. C2. Obtaining knowledge about the sources of digital spatial data describing the environment and the methods of obtaining them.</p> <p>Lab: C3. Providing students with practical skills enabling the opening, edition and analysis of digital spatial data with the use of GIS. C4. Providing students with practical skills to make maps and other graphic presentations with the use of GIS and digital spatial data.</p>
<p>4.2. Detailed syllabus (including form of classes)</p> <p>Lectures</p> <ol style="list-style-type: none"> 1. Geographic information systems - introduction (spatial information infrastructure, GIS data models Coordinate systems) 2. Sources of spatial data - reference and thematic data 3. Organization and management of spatial data 4. Attributes of spatial data 5. GIS data standard in nature protection 6. Spatial analysis - overlay analysis, algebra map, geocoding, network analysis 7. Model builder - application and examples of complex analytical procedures 8. Digital cartography in GIS - visualization of spatial data

<p>Lab:</p> <ol style="list-style-type: none"> 1. Introduction to the QGIS program (2h) 2. Basic models of spatial data (2h) 3. Vector model - screen vectorization (2h) 4. Raster model - DTM, NMPT, density maps (2h) 5. Sources of spatial data (2h) 6. Selected data management tools (2h) 7. Attribute table (2h) 8. Field calculator (2h) 9. GIS data standard in the nature protection (2h) 10. Spatial analyzes (2h) 11. Coordinate systems (2h) 12. Symbolization of spatial data (4h) 13. Composition of maps and visualization (4h)
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4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Provides examples of the use of geographic information systems (GIS) in modelling phenomena and processes occurring in the natural environment in the field of environmental protection and a selected specialization	OS2A-W05
W02	Knows the models of digital representation of elements of the geographical environment in GIS and the possibilities of their practical use	OS2A-W06
within the scope of ABILITIES:		
U01	Can use geographic information systems in environmental analyzes	OS2A-U04
U02	Can independently interpret the results and draw conclusions on the basis of spatial analyzes carried out in GIS	OS2A-U02
within the scope of SOCIAL COMPETENCE:		
K01	He is ready to explain the proper behaviour towards the natural environment using the results of spatial analyzes and their visualizations	OS2A-K01
K02	He is responsible for the entrusted computer equipment, as well as for the safety of his own work at the computer station	OS2A-K02

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01				X							X										
W02				X							X										
U01								X						X							
U02								X						X							
K01					X									X							
K02														X							

*DELETE AS APPROPRIATE

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	3	Student briefly presents what geographic information systems are, lists their types, lists digital spatial data models, describes the basic features of spatial analyzes
	3,5	Student briefly presents what geographic information systems are, lists their types, describes digital spatial data models, knows national sources of spatial data, lists various types of spatial analyzes
	4	Defines the concept of geographic information systems, lists the types of GIS systems, describes the differ-

		ences between them, describes the structure and models of digital spatial data, knows the national sources of spatial data, can indicate the differences between different models of digital spatial data recording, lists various types of spatial analyzes and briefly characterizes them
	4,5	Defines the concept of geographic information systems, lists the types of GIS systems, describes the differences between them, knows the analytical capabilities of several types of GIS software, describes the structure and models of digital spatial data, knows domestic and foreign sources of spatial data, describes the differences between various models of recording digital spatial data, lists various types of spatial analyzes and describes what they are about, is able to design a simple analytical procedure for the implementation of a given task
	5	He independently defines the concept of geographic information systems, lists the types of GIS systems, describes the differences between them, knows the analytical capabilities of several types of GIS software, describes the structure and models of digital spatial data, knows national and foreign sources of spatial data, describes the differences between various models of recording digital spatial data, explains the differences between the various available sets of spatial data describing the same objects, lists different types of spatial analyzes and describes what they consist in, can design a complex analytical procedure for the implementation of a given task
classes (C)* (including e-learning)	3	Has basic ability to use selected GIS software, is able to find and display digital spatial data sets, knows the basic coordinate systems used in GIS, creates simple cartographic visualizations
	3,5	Has basic ability to use selected GIS software, is able to find and display sets of digital spatial data, is able to modify the geometry and attributes of vector data, knows the basic national coordinate systems used in GIS, creates simple cartographic visualizations, performs spatial and attribute queries
	4	Has basic ability to use selected GIS software, is able to find and display sets of digital spatial data, is able to convert the spatial data model, is able to modify the geometry and attributes of vector data, also with the use of a field calculator, knows the basic national coordinate systems used in GIS and is able to make them transformations, creates complex cartographic visualizations using the map creator, performs spatial and attribute queries
	4,5	Has intermediate ability to use selected GIS software, can find and display sets of digital spatial data, can modify the geometry and attributes of vector data, also using a field calculator, can modify the attributes and resolution of raster data, can convert the spatial data model, know the basic national and foreign coordinate systems used in GIS and is able to transform them, creates complex cartographic visualizations using the map creator, performs spatial and attribute queries
	5	Uses the selected GIS software in an advanced manner, can find and display sets of digital spatial data, can modify the geometry and attributes of vector data, also with the use of a field calculator, can modify the attributes and resolution of raster data, can convert the spatial data model, know basic domestic and foreign coordinate systems used in GIS and transforms them, creates complex cartographic visualizations using the map creator and various symbolization methods, performs spatial and attribute queries

5. BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	45	
<i>Participation in lectures*</i>	15	
<i>Participation in classes, seminars, laboratories*</i>	30	
<i>Preparation in the exam/ final test*</i>		
<i>Others (please specify e.g. e-learning)*</i>		
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	55	
<i>Preparation for the lecture*</i>		
<i>Preparation for the classes, seminars, laboratories*</i>		
<i>Preparation for the exam/test*</i>		
<i>Gathering materials for the project/Internet query*</i>		
<i>Preparation of multimedia presentation</i>		
<i>Others *</i>		
TOTAL NUMBER OF HOURS	100	
ECTS credits for the course of study	4	

**delete as appropriate*

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)

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