

## COURSE GUIDE

<u>Subject name</u>	Geographical information systems in logistics E
<u>Course of study</u>	<b>Logistics</b>
<u>The form of study</u>	<b>Full-time</b>
<u>Level of qualification</u>	2 <sup>nd</sup> level
<u>Year</u>	2
<u>Semester</u>	4
<u>The implementing entity</u>	Katedra Regionalistyki i Zarządzania Ekorozwojem
<u>The person responsible for preparing</u>	Tomasz Nitkiewicz
<u>Profile</u>	<b>General academic</b>
<u>Course type</u>	<b>basic/principal/elective/other</b>
<u>ECTS points</u>	<b>6</b>

### TYPE OF TEACHING – NUMBER OF HOURS PER SEMESTER

LECTURE	CLASS	LABORATORY	PROJECT	SEMINAR
15		45L	-	-

### COURSE AIMS

- C1. Presenting and discussing Geographical Information Systems (GIS) theories, definitions and tools**
- C2. Presenting forms of GIS use in logistics**
- C3. Building competences for GIS use in context of logistics**

### ENTRY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of reading and interpreting maps
2. Advanced knowledge on logistics, its practical implementation and problem solving toolbox
3. Basic knowledge on computer use

### LEARNING OUTCOMES

- EK 1- Student identifies GIS, its use and tools**
- EK 2- Student identifies GIS data and tools for solving logistic problems**

**EK 3- Student uses Q-GIS software to address logistic issues**

**EK 4- Student uses Internet resources for searching geographically related logistic information**

### COURSE CONTENT

<b>Type of teaching – LECTURE</b>		<b>Number of hours</b>
L 1	Basics of cartography, types of maps, classification of geographical projections	2
L 2	Systematic of information systems, information systems in geography, classification of GIS, GIS for logistics	3
L3	Information structure in GIS, information sources, data quality, spatial and non-spatial data, dynamics of GIS data	3
L4	Raster and vector types of projections and , file formats for raster and vector, types of objects, layer based projections, logistics object in raster and vector layers	4
L5	Editing layers, types on analytical tools, logistical simulations and optimizations	3
<b>Type of teaching – LABORATORY</b>		<b>Number of hours</b>
LA1	Searching through internet based GIS resources, interpreting maps	5
LA2	Logistic oriented use of GIS Internet based resources (Route designing and optimization)	5
LA3	Relating GPS to GIS (transferring GPS data to GIS)	5
LA4	Presenting logistic infrastructure (maps drawing, designing vector layers with raster underlying layer, importing layers, database projecting and using)	15
LA5	Solving logistic problems with GIS (use of different GIS based tools: buffer, communication trail designing, route optimization)	15

### TEACHING TOOLS

1. Internet based geographical portals (p.e. Google maps)
2. GIS software (Q-GIS)
3. Audio-visual devices
4. Office software (databases and spreadsheets)
5. Presentations

### WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

**F1. Laboratory tasks**

**F2. Data collection tasks**

**P1. Written exam**

### STUDENT WORKLOAD

<b>Form of activity</b>		<b>Average number of hours for realization of the activity</b>		
		<b>[h]</b>	<b>ECTS</b>	<b>ECTS</b>
Contact hours with the teacher	LECTURES	15	0,6	2
Preparation for exam		15	0,6	
Reading and websearching		20	0,8	
Contact hours with the teacher	LABORATORIES	45	1,8	4
Data collection		15	0,6	
Conslutations		15	0,6	
Preparation for lab tasks		25	1,0	
<b>TOTAL NUMBER OF HOURS / ECTS POINTS FOR THE COURSE</b>		<b>150</b>	<b>6</b>	

## BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

### Basic resources:

1.	GIS Research Methods: Incorporating Spatial Perspectives / Sheila Lakshmi Steinberg, Steven J. Steinberg, New York : Esri Press, 2015.
2.	Geographic Information Systems in Transportation Research / Ed. Jean-Claude Thill, Bingley : Emerald Group Publishing Limited, 2009.
3.	Handbook of Applied Spatial Analysis: Software Tools, Methods and Applications / eds. Manfred M. Fischer, Arthur Getis, Berlin : Springer-Verlag, 2010.

### Supplementary resources:

1.	Hanbook of Transport Geography and Spatial Systems / Ed.David A. Hensher, Amsterdam : Elsevier Science, 2004.
2.	David Davis, GIS dla każdego, Wydawnictwo Naukowe PWN, 2009
3.	Systemy informacji przestrzennej z QGIS: część I i II : podręcznik akademicki / Robert Szczepanek, Kraków : Wydaw. Politechniki Krakowskiej im. Tadeusza Kościuszki, 2017

### TEACHERS ( NAME, SURNAME, E-MAIL ADDRESS)

1. Tomasz Nitkiewicz, [tomasz.nitkiewicz@wz.pcz.pl](mailto:tomasz.nitkiewicz@wz.pcz.pl)
2. Katarzyna Rozpondek, [katarzyna.rozpondek@wz.pcz.pl](mailto:katarzyna.rozpondek@wz.pcz.pl)

### MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program	Course aims	Course content	Teaching tools	Ways of assessment
EK 1	K_W05, K_W09, K_W17	C1-C3	L1-L5, LA1	1-4	P1, F1, F2
EK 2	K_W05, K_W09, K_W10, K_U20	C1-C3	L2-L5, LA2, LA4-LA5	1-4	P1, F1, F2
EK 3	K_W05, K_W09, K_U07, K_U19, K_U23	C1-C3	L3-L5, LA3-LA5	1-4	P1, F1, F2
EK 4	K_W05, K_W09, K_W17, K_W24, K_U20	C1-C3	L2-L3, LA1-LA3	1-4	P1, F1

### FORM OF ASSESSMENT - DETAILS

	grade 2	grade 3	grade 4	grade 5
EK 1	Student has no knowledge on GIS and its tools	Student has basic knowledge on GIS and some of its tools	Student has comprehensive knowledge on GIS and basic of its selected tools	Student has comprehensive knowledge on GIS and on its selected tools
EK 2	Student has no skills in finding and selecting appropriate GIS data and tools for solving given logistic problem	Student has basic skills in finding GIS data and tools for solving given logistic problem	Student has basic skills in finding and selecting appropriate GIS data and tools for solving given logistic problem	Student has comprehensive skills in finding and selecting appropriate GIS data and tools for solving given logistic problem

EK 3	Student is unable to use Q-GIS software	Student is able to use Q-GIS software to interpret and search tasks	Student is able to use Q-GIS software to interpret, search and map design tasks	Student is able to use Q-GIS software to interpret, search and map design and problem solving tasks
EK 4	Student is unable to find selected information in Internet based GIS resources	Student is able to find selected information in Internet based GIS resources	Student is able to find comprehensive information in Internet based GIS resources and solve basic logistic problems	Student is able to choose appropriate Internet based GIS resources and use its analytical modules to solve related logistic problems

**ADDITIONAL USEFUL INFORMATION ABOUT THE COURSE**

1. Information where presentation of classes, instruction, subjects of seminars can be found, etc. – information presented during the course, accessible electronically on appropriate webpage, distributed via emails
2. Information on the place where the classes take place – information accessible through Faculty webpage
3. Information on the date of classes (day of the week/hour) - information accessible through Faculty webpage
4. Information on consultation hours (hours + place) - information accessible through Faculty webpage and presented on the Department dashboard

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Coordinator