

COURSE GUIDE

<u>Subject name</u>	Geographical information systems in logistics
<u>Course of study</u>	Logistics
<u>The form of study</u>	Full-time
<u>Level of qualification</u>	second level
<u>Year</u>	2
<u>Semester</u>	4
<u>The implementing entity</u>	Katedra Informatyki Ekonomicznej i Ekosystemów Zarządzania
<u>The person responsible for preparing</u>	Dr hab. inż. Tomasz Nitkiewicz
<u>Profile</u>	General academic
<u>ECTS points</u>	6

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

Student can read and interpret maps.

Student have advanced knowledge on logistics, its practical implementation and problem solving toolbox.

Student can use the computer software with graphic interface.

LEARNING OUTCOMES

EU 1- Student identifies GIS, its use and tools.

EU 2- Student identifies GIS data and tools for solving logistic problems.

EU 3- Student uses Q-GIS software to address logistic issues.

EU 4- Student uses Internet resources for searching geographically related logistic information.

COURSE CONTENT

Type of teaching – LECTURE		Number of hours
L 1	Basics of cartography, types of maps, classification of geographical projections.	3
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.	3
L5	Editing layers, types on analytical tools, logistical simulations and optimizations.	3
Type of teaching – LABORATORY		Number of hours
LA1	Introduction to the QGIS program.	3
LA2	Searching through internet based GIS resources, interpreting maps.	3
LA3	The issue of the work with vector data and its attributes.	3
LA4	The issue of the work with raster data.	3
LA5	Ways of creating a new vector dataset.	3

LA6	The role of topology in recording information about the relations of objects in space.	3
LA7	Classification of vector data based on selected criteria.	3
LA8	Network services and the use of open data.	3
LA9	Spatial analysis as a source of knowledge based on data – sources of data.	3
LA10	Spatial analysis as a source of knowledge based on data – geoprocessing tools.	3
LA11	The role of spatial and attribute queries in decision making.	3
LA12	Principles of creating and editing maps.	3
LA13	Overview of areas of using GIS in logistics.	3
LA14	Solving logistics problems with GIS - case solution and analysis.	3
LA15	Summary of the use of GIS in logistics.	3

TEACHING TOOLS

Internet based geographical portals (p.e. Google maps).

GIS software (Q-GIS).

Audio-visual devices.

Office software (databases and spreadsheets).

Presentations.

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

F1. Laboratory tasks.

F2. Data collection tasks.

P1. Written exam.

STUDENT WORKLOAD

Form of activity	Average number of hours for realization of the activity
	[h]
Contact hours with the teacher	60
Preparation for exam	15
Reading and websearching	20
Data collection	15
Conslutations	15
Preparation for lab tasks	25
TOTAL NUMBER OF HOURS / ECTS POINTS FOR THE COURSE	150/6

BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

Basic resources

GIS Research Methods: Incorporating Spatial Perspectives / Sheila Lakshmi Steinberg, Steven J. Steinberg, New York : Esri Press, 2015.

Geographic Information Systems in Transportation Research / Ed. Jean-Claude Thill, Bingley : Emerald Group Publishing Limited, 2009.

Handbook of Applied Spatial Analysis: Software Tools, Methods and Applications / eds. Manfred M. Fischer, Arthur Getis, Berlin : Springer-Verlag, 2010.

Supplementary resources

Handbook of Transport Geography and Spatial Systems / Ed. David A. Hensher, Amsterdam: Elsevier Science, 2004.

David Davis, GIS dla każdego, Wydawnictwo Naukowe PWN, 2009

Systemy informacji przestrzennej z QGIS: część I i II : podręcznik akademicki / Robert Szczepanek, Kraków : Wydaw. Politechniki Krakowskiej im. Tadeusza Kościuszki, 2017

Rozpondek K. (2020), Geographic Information System as a Tool to Support Environmental Monitoring and Management - Case Study of Bottom Sediments, Rocznik Ochrona Środowiska, 22, 2, pp. 648-668.

Nitkiewicz, T. (2017). Wykorzystanie środowiskowej oceny cyklu życia w analizie procesów i przepływów logistycznych. Częstochowa: Wyd. Politechniki Częstochowskiej.

TEACHERS (NAME, SURNAME, E-MAIL ADDRESS)

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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
EU 1	K_W02, K_W03, K_U01, K_K03	C1-C3	L1-L5, LA1	1-4	P1, F1, F2
EU 2	K_W02, K_W03, K_K02	C1-C3	L2-L5, LA2, LA4-LA5	1-4	P1, F1, F2
EU 3	K_W02, K_W03, K_U04, K_K02	C1-C3	L3-L5, LA3-LA5	1-4	P1, F1, F2
EU 4	K_W02, K_W03, K_K02	C1-C3	L2-L3, LA1-LA3	1-4	P1, F1

FORM OF ASSESSMENT - DETAILS

	grade 2	grade 3	grade 4	grade 5
EU 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.

EU 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.
EU 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.
EU 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

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

Information on the place where the classes take place – information accessible through Faculty webpage

Information on the date of classes (day of the week/hour) - information accessible through Faculty webpage

Information on consultation hours (hours + place) - information accessible through Faculty webpage and presented on the Department dashboard