SYLLABUS

Name:	**GIS technologies in logistic processes**
Name in Polish:	**Technologie GIS w procesach logistycznych**
Name in English:	**GIS technologies in logistic processes**

Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Bechelor's degree, Full-time
Term:	winter semester 2020/2021, spec. Production and Logistic Systems in Industrial Enterprises
Coordinator of course edition:	Phd Marek Szafraniec

Default type of course examination report:

PASS

Language:

English

Course homepage:

https://platforma.polsl.pl/roz/course/view.php?id=622

ECTS

2

Short description:

Providing structured knowledge, skills and social competences related to the use of available methods and tools for obtaining, managing, processing, sharing map information, conducting spatial analyzes and their role in the company's information system in the context of logistic processes.

Description:

Detailed content:
Lectures (15h):

- Introduction to the subject of GIS systems.
- Basic concepts, definitions and evolution of GIS systems.
- Spatial information systems in the industrial environment - classification of GIS systems. Features and functions of GIS systems.
- Databases in GIS systems. The concept of a digital map and its elements: layers, objects, descriptive attributes.
- GIS software - commercial and as an opensource. Open Geospatial Consortium (OGC).
- Sources and methods of obtaining external spatial data. WMS services and other external sources of spatial data and information. National centers of geodesy and cartography. Others GPS systems: NAVSTAR, GALILEO, GLONASS.
- Spatial analyzes: layering, aggregating features, creating buffer areas. Network analysis.
- Advantages, disadvantages and limitations of GIS systems.

Laboratories (30h):

- Introduction to the use of QGIS software,
- Interface personalization of QGIS,
- Exploration of sample data in QGIS,
- Getting skills and knowledge of the basic functions of the QGIS system,
- Using external data sources, using WMS services.
- Working with layers, objects and tables - adding, processing and deleting elements,
- The use of plugins - add-ons and modules extending the analytical functionality of QGIS software,
- Create your own layers, features and attribute tables in QGIS,
- Conducting spatial analyzes: layering, aggregating features, creating buffer areas.
- Conducting network analyzes.
- Conducting selected economic, economic and environmental analyzes in QGIS,

Project (15h):

- preparation of an optimized project that includes:
  - a proper goal related to the studied specialization
  - processed layers of data retrieved from open sources
  - self-created data layers,

- used raster and vector layer of data
- used three kinds of vector layers objects – lines, points, polygons
- objects on all layers assigned attributes for each type of object,
- an plugin extending the functionality of the created spatial data system
- performed filtering to demonstrate the system functionality
- carried out and presented the effect of real spatial analyses,

- Conducting selected economic, economic and environmental analyzes in QGIS

Number of hours of classes with members of academic staff or other persons conducting classes and students

- Lecture: 15h
- Laboratory – 30 hours
- Project: 15h

The number of hours devoted to the student's own work

- Test preparation: 5 hours
- Performing laboratory tasks: 5 hours.
- Project preparation: 5 hours

Total number of hours: 75
Number of ECTS points for the subject: 2
including: number of ECTS points obtained as part of classes conducted with the participation of academic teachers or other course participants and students: 2

Bibliography:

- QGIS Desktop Guide/Manual. (QGIS 3.12), QGIS Project, 2020.
- QGIS Server Guide/Manual (QGIS 3.16), QGIS Project, 2020.
- Laurini R., Thompson D., Fundamentals of spatial information systems. The APIC Series, no 37, London 1999.

Learning outcomes:

Lectures:
K2A_W02 - a student knows and understands main trends of development in the discipline of mechanical engineering in connection with other disciplines in the context of spatial information systems

Laboratories/Project
K2A_W13 - a student knows and understands fundamental dilemmas of the contemporary world, especially in relation to the development of technology in the context of spatial information systems
Laboratories/Project
K2A_U01 - a student is able to Use the acquired knowledge - formulate and solve complex and unusual problems and innovatively perform tasks in unpredictable conditions by: proper selection of sources and information derived from them; evaluation of the information, its critical analysis, synthesis, creative interpretation and presentation; selection and use of adequate methods and tools, including advanced ICT techniques; adapting existing or developing new methods and tools.in the context of spatial information systems
K2A_U02 - a student is able to perform tasks as well as formulate and solve problems using new knowledge, including the knowledge from other in the context of spatial information systems
K2A_K02 - a student is ready for recognition of the importance of knowledge in solving cognitive and practical problems; consulting experts in the event of difficulties in solving the problem on his/her own in the context of spatial information systems

Assessment methods and assessment criteria:

Lectures

- A positive grade from written test is needed to pass the lecture,
- To pass the test, at least 50% correct answers are required,
- The test can be improved twice - in written or oral form,
- Being active and participating in a constructive discussion during classes can raise the grade for the final test

Laboratory

- the condition for passing the laboratory classes is the development and submission of a report on the laboratory work performed that meets the formal requirements.
- reports prepared incorrectly may be corrected twice.

Project

- the condition for passing the project classes is the development and submission of a report on the completed project that meets the formal requirements. • reports prepared incorrectly may be corrected twice.

The final grade is the arithmetic mean of the grade from lectures and laboratory.

Practical placement: