

SYLLABUS

Name: GIS systems in industrial environment
Name in Polish: Systemy GIS w środowisku przemysłowym
Name in English: GIS systems in industrial environment

Information on course:

Course offered by department: Faculty of Organisation and Management
Course for department: Silesian University of Technology
Study level and form: Bachelor's degree, Full-time
Term: 2025/2026, spec. Management of production systems in a modern enterprise
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=789>

ECTS

3

Short description:

The classes are intended to provide structured knowledge, acquire skills and social competences related to the use of available methods and tools of spatial information systems, supporting decision-making processes in solving problems in the industrial environment and the integration of these tools with the enterprise information system.

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 (15h):

- 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,

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

- Lecture: 15h
- Laboratory – 15h

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

- Test preparation: 30 hours
- Performing laboratory tasks: 30 hours.

Total number of hours: 90

Number of ECTS credits for the subject: 3

including: number of ECTS credits obtained as part of classes conducted with the participation of academic teachers or other course participants and students: 1

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:

K1A_W7 - a student knows and understands fundamental problems of contemporary civilization relevant to the production engineering. in the context of spatial information systems

Laboratories:

K1A_U3 - a student is able to plan and conduct experiments, including measurements and computer simulations, visualize data and interpret the obtained results and draw conclusions in the context of spatial information systems

K1A_U7 – student is able to work individually and in a team, assuming different roles in it, plan and organize this work, as well as interact with other people as part of teamwork in the context of spatial information systems (also of an interdisciplinary nature) using specialist terminology and modern information and communication technologies, and take part in the debate.

K1A_U9 – student is able to select and use appropriate techniques, skills and modern engineering tools in the context of spatial information systems

K1A_K01 – is ready for a Critical evaluation of knowledge and received content, recognition of the importance of knowledge in solving cognitive and practical problems, and consulting experts in the event of difficulties in solving problems on their 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.

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

Practical placement: