SYLLABUS

Name: IT and ICT technologies in sustainable enterprise Name in Polish: Technologie IT i ICT w zrównoważonym przedsiębiorstwie Name in English: IT and ICT technologies in sustainable enterprise

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, spec. Management of sustainable consumption and production
Term:	winter semester (5 semester) 2024/2025
Coordinator of course edition:	Phd Beata Hysa, Phd Marek Szafraniec

Default type of course examination report:

Language:	
English	
Course homepage:	
https://platforma.polsl.pl/roz/	
ECTS	
6	

Short description:

The main objective of the course is to help students learn about the concepts, theories and applications concerning the field of IT and ICT for sustainable development. The students are expected to learn how ICTs can be best applied for sustainability challenges. **Description:**

Lectures

- The role and importance of IT and ICT in sustainable development
- Information and communication technologies supporting sustainable development in selected areas (health, education, tourism, urban management).
- Innovative business models for sustainable development (mobile and online tools)
- Selected aspects of IT and ICT tools for sustainable development (Green IT, Smart City, Internet of Things, Sustainable Human-Computer Interaction)
- Critical success factors and constraints for ICT and IT adoption for sustainable development.
- 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.

Laboratory

- Use of commercial and non-commercial applications to solve problems related to the management of organisations for sustainable development.
- Mobile and Internet technologies in decision making related to the management of a sustainable enterprise
- 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:

Prepare a project on the use of ICT or IT tools in a sustainable enterprise.

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

- Lecture: 30h
- Laboratory 30h
- Project 30h.

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

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

Total number of hours: 180

Number of ECTS credits for the subject: 6

including: number of ECTS credits obtained as part of classes conducted with the participation of academic teachers or other course participants and students: 3

Bibliography:

- Marolla Cesar (2019)Information and Communication Technology for Sustainable Development, CRC Press, Taylor and Francis corporation
- Mohamed Ben Ahmed (Author), Sehl Mellouli (Editor), Luis Braganca (Editor), Boudhir Anouar Abdelhakim (Editor), Kwintiana Ane Bernadetta (Editor) (2020) Emerging Trends in ICT for Sustainable Development: The Proceedings of NICE2020 International Conference Paperback – Jan. 24 2022, Springer Nature; 1st ed. 2021 edition (Jan. 24 2022)
- Ziemba Ewa, Karmańska Anna (2021) ibuk.pl, Transformacja cyfrowa organizacji i społeczeństw, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach
- Fajczak-Kowalska Anita, Misztal Anna Green IT w zrównoważonym biznesie (2020) (ebook), Wydawnictwo Politechniki Łódzkiej
- 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:

The student knows (knowledge):

1. advanced issues in the field of engineering and technical sciences useful for formulating and solving tasks related to the use of IT and ICT in sustainable development and business (K1A _W1).

2. fundamental problems of contemporary civilisation related to sustainable development and relevant to management and production engineering (K1A_W7).

The student is able (skills):

1. plan and conduct experiments, including measurements and computer simulations, visualize data and interpret the obtained results and draw conclusions (K1A_U3)

2. when identifying, formulating and solving engineering tasks: select and use organisational management methods and tools, including computerassisted methods, for identifying, analysing and solving organisational management problems in the field of sustainable development, recognising their systemic and non-technical aspects, including ethical aspects (K1A U4)

3. select and use appropriate techniques, skills and modern engineering tools (K1A _U9)

4. independently plan and manage their own lifelong learning (K1A _U11)

The student is prepared to (social competences):

1. fulfilling social obligations, co-organizing activities for the social environment, initiating activities for the public interest, thinking and acting in an entrepreneurial manner (K1A _K2)

Assessment methods and assessment criteria:

The course is assessed by a written examination. To pass the course, students must obtain a pass in the final examination in the lectures and a pass in the laboratory classes and the final project. It is compulsory for the students to attend laboratory and design classes. Lectures are held on the dates indicated in the syllabus. Attendance at lectures is not compulsory, but you must complete the programme content.

Practical placement: