**SYLLABUS**

**Name: Closed loop economy**
**Name in Polish: Gospodarka obiegu zamkniętego**
**Name in English: Closed loop economy**

**Information on course:**

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| **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 2024/2025 |
| **Coordinator of course edition:** | Prof. dr hab. Grażyna Płaza |

**Default type of course examination report:**

Passing the course

**Language:**

English

**Course homepage:**

https://platforma.polsl.pl/roz/

**ECTS**

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**Short description:**

The class is designed to familiarize students with the functioning of the closed-loop economy as a solution to some of the environmental problems of the modern world and development towards sustainability.

**Description:**

The purpose of the course is to familiarize students with the functioning of the closed-loop economy as a solution to some environmental problems, and to discuss issues related to the monitoring of the closed-loop economy contained in four aspects: production and consumption, waste management, secondary raw materials, and competitiveness and innovation.
Concept and tools of circular economy. Benefits of implementing the principles of closed-loop economy. The green industrial revolution. Monitoring of circular economy in UE regulations. Selected existing closed-loop monitoring frameworks proposed by: European Commission (2018), OECD (2017), World Bank (2017), European Environment Agency (2016). Closed-loop economy monitoring framework according to EU: a) Production and consumption: EU self-sufficiency in raw materials, green public procurement, waste generation, food waste; b) Waste management: total recycling rate, recycling rates for specific waste streams; c) Secondary raw materials: impact of recycled materials on demand for raw materials.
Lecture: multimedia presentation, analysis of examples on monitoring the closed loop economy - in the form of discussion.
Exercises: group project, group work, preparing a presentation on a selected topic related to GOZ - examples of implementation of GOZ principles.
Forms of teaching, including the number of teaching hours:
Lecture: 30 hours
Exercises: 30 hours

**Bibliography:**

Pikoń K. (2018) Gospodarka obiegu zamkniętego w ujęciu holistycznym. Wydawnictwo Politechniki Śląskiej, Gliwice.
Kulczycka J. Gospodarka o obiegu zamkniętym w polityce i badaniach naukowych Instytut Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk wyd. IGSMiE PAN Kraków 2019.

**Płaza G**. (2018) Green production – green industry: Bioeconomy and bio-based products Monografia, Wyd. Politechnika Śląska

Lorek, A. (2018). Znaczenie podstaw i zachowań konsumentów w kształtowaniu gospodarki obiegu zamkniętego. Research Papers of the Wroclaw University of Economics Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu.
Górzyński K.: Wprowadzenie do oceny cyklu życia (LCA) – nowej techniki w ochronie środowiska. Inżynieria Środowiska 2006, t. 11, z. 1, 111-113.
Zarębska, J., & Joachimiak-Lechman, K. (2016). Gospodarka o obiegu zamkniętym – rola LCA, szanse, bariery, wyzwania. Logistyka Odzysku, (1 (18), 41-45.
Rutkowska, M., & Popławski, Ł. (2017). Model zrównoważonej gospodarki o obiegu zamkniętym. Studia i Prace WNEiZ US, 47 T. 2. Problemy współczesnej ekonomii, 119-128.
- Mapa Drogowa transformacji w kierunku gospodarki o obiegu zamkniętym, „Green deal"

**Learning outcomes:**

Knowledge: the student knows and understands
K1A _W3: Basic engineering processes and technologies occurring in the life cycle of technical equipment, objects and systems, as well as ways of solving typical engineering tasks, especially in relation to the organization of production processes and production management.
K1A _W6: Basic principles and objectives of sustainable development and their importance in the product life cycle.
K1A _W7: Fundamental problems of modern civilization relevant to management and production engineering.
Skills: the student can:
K1A _U4: When identifying and formulating specifications for engineering tasks and solving them:
- select and use analytical, simulation and experimental methods, including computer-aided methods,
- recognize their system and non-technical aspects, including ethical aspects,
- make a preliminary economic assessment of the proposed solutions and engineering activities undertaken,
- analyze technology transfer and innovation.

K1A _U5: Make a critical analysis of how existing technical and technological solutions in production systems function, evaluate these solutions, diagnose problems, and propose appropriate improvements and innovations in this regard.
K1A _U10: Integrate and apply interdisciplinary knowledge of engineering and technical sciences, taking into account the principles of sustainable development to product life cycle management.
Social competence: the student is ready to:
K1A _K1: Critically evaluate the knowledge possessed and the content received, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts when having difficulties in solving problems independently.

**Assessment methods and assessment criteria:**

Lecture: credit by test
Grading criteria:
Lecture: credit on the basis of a test (closed questions). Ongoing control of knowledge during lectures, verification of knowledge of the subject - credit on the basis of a test. Obtaining at least 51% of the points from the test.
Exercises: presentation thematically related to the lecture on the basis of the developed scientific article.

**Practical placement:**

Not applicable