



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Monitoring of the Circular Economy

### Course

Field of study

Circular System Technologies

Area of study (specialization)

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Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Justyna Werner, PhD

Responsible for the course/lecturer:

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### Prerequisites



The student has basic general knowledge of the circular economy, sustainable development. The student has the ability to obtain the necessary information from literature, laws and regulations and databases.

### Course objective

The aim of the lecture is introduction of students with the functioning of the circular economy as a solution to some environmental problems and to discuss issues related to the monitoring of the circular economy in four aspects: production and consumption, waste management, secondary raw materials, as well as competitiveness and innovation.

### Course-related learning outcomes

#### Knowledge

K\_W03 The student has knowledge of mathematics, physics and chemistry necessary to describe the concepts and principles of circular system technology and the characteristics of connections and dependencies between its components.

K\_W09 The student knows the techniques and methods of monitoring typical chemical environmental pollutants.

K\_W10 The student has knowledge of raw materials, products and processes used in circular system technologies.

K\_W11 The student has knowledge of techniques, methods of identification and characterization of main and by-products in circular system technologies.

K\_W12 The student has a basic knowledge of the life cycle of products, devices and installations used in circular system technologies.

K\_W26 The student knows the basic legal acts concerning the circular economy.

#### Skills

K\_U01 The student is able to obtain information from literature, databases and other sources related to circular system technologies, also in a foreign language, integrate them, interpret them, and draw conclusions and formulate opinions.

K\_U04 The student has the ability to self-study, is able to use source information in Polish and a foreign language in accordance with the rules of ethics, reads with understanding, conducts analyzes, syntheses, summaries, critical assessments and correct conclusions.

K\_U05 The student correctly uses in the discussion and properly uses the nomenclature and terminology in the field of circular system economy, chemistry, technology and chemical engineering, environmental protection and related disciplines, also in a foreign language.

#### Social competences

K\_K05 The student objectively assesses the level of his knowledge and skills, understands the



importance of improving professional and personal competences adequately to the changing social conditions and the progress of science.

K\_K06 The student thinks and acts in an entrepreneurial manner.

K\_K09 The student supports the idea of a harmonious, global civilization and economic development, promoting the principles of a circular economy, sustainable development and rational management of natural environment resources on a local and global scale.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Current knowledge control during lectures, checking the knowledge of the subject - assessment in the form of a test. Obtaining at least 51% of the points on the test.

### Programme content

1. The concept of development of the circular economy.
2. Product life cycle.
3. Monitoring of the circular economy in the regulations of the European Union.
4. Selected existing framework for monitoring of the circular economy proposed by:
  - European Commission (2018),
  - OECD (2017),
  - World Bank (2017),
  - European Environment Agency (2016),
5. A framework for monitoring of the circular economy according to the European Commission:
  - 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 individual waste streams.
  - c) Secondary raw materials:



- the impact of recycled materials on the demand for raw materials,
- trade in raw materials that can be recycled.

d) Competitiveness and innovation:

- private sector investments,
- workplaces
- gross value added
- patents.

5. The framework for monitoring of the circular economy according to OECD:

- a) the productivity of the use of raw materials
- b) regulations supporting circular transformation
- c) exploiting the natural resource base
- d) the impact of activities consistent with circular concepts on the quality of people's lives.

6. Circularity indicators.

7. Set of circular economy indicators for the Polish economy at the regional level:

- a) Major (change in the value of assets in the region's economy, value added, impairment, EU net export)
- b) Auxiliary (material consumption, non-renewable energy consumption, drinking water consumption, ratio of household expenditure on repairs and modernization of assets in relation to total consumption expenditure, use of recycled materials in production processes, total weight of waste, weight of food waste)
- c) Contextual (environmental footprint, percentage of full-time jobs in industries related to circular concepts in relation to total employment, value of circular public procurement in total public procurement)

### Teaching methods

Lecture: multimedia presentation, analysis of examples concerning the monitoring of the circular economy - in the form of a discussion

### Bibliography

Basic

Lorek, A. (2018). ZNACZENIE POSTAW I ZACHOWAŃ KONSUMENTÓW W KSZTAŁTOWANIU GOSPODARKI



OBIEGU ZAMKNIĘTEGO. Research Papers of the Wrocław University of Economics Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, (533).

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.

Additional

Rutkowska, M., & Popławski, Ł. (2017). Model zrównoważonej gospodarki o obiegu zamkniętym. Studia i Prace WNEiZ US, (47 T. 2. Problemy współczesnej ekonomii), 119-128.

Rosik-Dulewska, C. (2007). Podstawy gospodarki odpadami. Wydawnictwo Naukowe PWN.

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	38	1,5
Student's own work (literature studies, preparation for tests) <sup>1</sup>	37	1,5

<sup>1</sup> delete or add other activities as appropriate