

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SUPERVISOR DECLARING/CONDUCTING COURSE: Prof. Herbert Wirth
DEPARTMENT: Faculty of Geoengineering, Mining and Geology
SCIENTIFIC DISCIPLINE: environmental engineering, mining and energy

COURSE CARD

Course name in Polish: Gospodarka obiegu zamkniętego projektów geologiczno-górnictwowych

Course name in English: CE of geological and mining project

Course language: polish / english

University-wide general course type*:

The course is intended for all PhD students: YES / NO

- 1) ~~BASIC COURSE~~
- 2) ~~SPECIALIST COURSE~~
- 3) ~~SEMINAR~~
- 4) ~~HUMANISTIC COURSE~~
- 5) ~~LANGUAGE~~

Subject code: IGQ100225W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)				15
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. basic mining and geology
2. basic environmental issue

COURSE OBJECTIVES

- C1 Discussion the basic principles and concepts CE
- C2 Know the LCA of geological and mining project
- C3 Identification of environmental aspects main phases of mineral project
- C4 Getting to know good practices of circular economy of mineral streams, water, land and Energy.

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PROGRAM CONTENTS

Form of classes		Number of hours
Lec1	Basic CE	2
Lec2, Lec3	Main phases of the geological and mining project	4
Lec4, Lec5	Identification of environmental aspects in the main phases geological and mining project	4
Lec6, Lec7, Lec8	Good practices in the use of waste raw material, water, land and energy	5
Total hours		15

TEACHING TOOLS USED

N1. lecture
N2. discussion
N3. exercise

ACHIEVED SUBJECT LEARNING OUTCOMES

Type of learning outcome	Code of learning outcome	Assessment of learning outcome
knowledge	P8S_WG	has advanced knowledge of directional subjects in a given discipline or in interdisciplinary subjects

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

1. J.Kulczycka (2020) Wskaźniki monitorowania gospodarki o obiegu zamkniętym. Kraków
2. R.Salamone et al (2020) Industrial symbiosis for the circular economy. Springer Verlag.

SECONDARY LITERATURE:

1. ISO 14040 Standard

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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