

Course title: Environmental biotechnology and bioreactors Biotechnologia środowiska i bioreaktory		
Field of study:		
Type of study: Wybierz element.	The level of education: Wybierz element.	Education profile:
Type of subject: optional	Semester: Wybierz element.	Course language: English
Course type: lecture, laboratory	Number of hours: 15L, 45Lab	ECTS Credit points: 7

SYLLABUS

COURSE OBJECTIVES

C.1. Kliknij lub naciśnij tutaj, aby wprowadzić tekst.

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Kliknij lub naciśnij tutaj, aby wprowadzić tekst.

SUBJECT EDUCATIONAL EFFECTS

EU 1 - Kliknij lub naciśnij tutaj, aby wprowadzić tekst.

COURSE CONTENT

Form of classes - lectures	Hours
Introduction to environmental biotechnology	1
Fermentation in environmental biotechnology – microbial growth kinetics and yield constants; Monod kinetics; types of fermentation	1
Bioreactors - types, designs, and functional characteristics	1
Biomining	2
Agricultural biotechnology	1
Bioremediation of groundwater and contaminated soil	2
Biotechnology for waste and wastewater treatment	2
Biorefineries	2
Applications of biotechnology in environmental monitoring – bioindicators, biomarkers, biosensors	2
Test	1
Form of classes – laboratory	Hours
Wastewater treatment	10
Evaluation of the degree of compost maturity on the basis of the germination index	4
Energy recovery from waste	12
Effect of lead and cadmium on morphological and physiological features of plants	4

Bioremediation of contaminated soil	12
Defense of studies	3

COURSE STUDY METHODS

1. blackboard
2. multimedia presentation
3. laboratory setup
4. the literature and instructions for laboratory classes

METHODS OF ASSESMENT (F - formative; S - summative)

F1. - activity in classes
F2. - evaluation of work during laboratory exercises
S1. – test
S2. - evaluation of the laboratory reports

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	15 h
Participation in classes	-
Laboratory	45 h
Participation in project classes	-
Participation in seminar	-
Preparation course on e-learning	-
Test	5 h
Entrance test for laboratory classes	15 h
Project's defence	3 h
Exam	-
Consultation hours	15 h
DIRECT TEACHING, hours/ ECTS	98 h / 5,36 ECTS
Preparation for tutorials	-
Preparation for laboratories	20 h
Preparation for projects	-
Preparation for seminars	-
Preparation for e-learning classes	-
Participation in e-learning classes	-
Working on project	-
Preparation for tests	10 h
Preparation for exam	-
SELF-STUDY, hours/ ECTS	30 h / 1,64 ECTS
TOTAL (hours)	128 Σ
TOTAL ECTS	7 ECTS

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

Scragg, A. H. (2005). Environmental biotechnology. New York: OXFORD university press.
Khan, F. A. (2020). Biotechnology fundamentals. CRC Press.
Vallero, D., Environmental Biotechnology: A Biosystems Approach (2010),
Sibi, G., (2023). Environmental Biotechnology Fundamentals to Modern Techniques, CRC Press
Bhat, R.A., (2022). Environmental Biotechnology, Apple Academic Press Inc.
Fulekar M. H., (2010). Environmental Biotechnology, CRC Press
Jördening, H-J., Winter J., (eds), (2005). Environmental Biotechnology: Concepts and Applications, Wiley-Blackwell

SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

1. Anna Grosser, anna.grosser@pcz.pl

NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)

1. Anna Grosser, anna.grosser@pcz.pl

OTHER USEFUL INFORMATION

1. All the information on the class schedule is posted on the student information board and online at: <https://is.pcz.pl/>.
2. The information about the consultation hours is provided to students on the first class meeting and posted online at <https://is.pcz.pl/>.
3. The information on course completion and grade is provided to students on the first class meeting.