DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR DECLARING/CONDUCTING COURSE: Dr inż. Grzegorz Pasternak
DEPARTMENT: FACULTY OF CHEMISTRY
SCIENTIFIC DISCIPLINE: CHEMICAL ENGINEERINIG

COURSE CARD

Course name in Polish: Technologia układów bioelektrochemicznych dla zrównoważonego rozwoju
Course name in English: Technology of bioelectrochemical systems for sustainability
Course language: English
The course is intended for all PhD students: YES

2) SPECIALIST COURSE

Subject code: CIQ100254W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge in chemistry
2. Basic knowledge in biology and physics

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COURSE OBJECTIVES

C1 Familiarising students with principles of bioelectrochemistry
C2 Introducing to wide range of bioelectrochemical methods applications

PROGRAM CONTENTS

Form of classes		Number of hours
Lec 1	Introduction to bioelectrochemical systems technology	2
Lec 2-3	Introduction to microbial growth and metabolism used in power generation	4
Lec 4	Principles of Microbial Fuel Cell (MFC) technology	2
Lec 5	R&D aspects of MFCs (methods, materials development)	2
Lec 6	Designs and applications for electricity production	2

Lec 7	Sediment MFCs and electrochemical snorkels	2
Lec 8	Microbial Electrolysis Cells	2
Lec 9	Microbial Desalination Cells	2
Lec 10	Bioelectrosynthesis	2
Lec 11	Biosensors based on bioelectrochemical systems	2
Lec 12	Biofuel cell sensors	2
Lec 13	Trends, concepts and inspirations for implementing bioelectrochemical reactors	2
Lec 14-15	Crediting with grade	4
	Total hours	30

TEACHING TOOLS USED
N1. Interactive presentation N2. Discussion

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8U_W	Test
Knowledge	P8S_WG	Test
Skills	P8U_U	Presentation and discussion
Skills	P8S_UK	Presentation and discussion

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
[1] Microbial Fuel Cells, Bruce E. Logan, 2007, DOI:10.1002/9780470258590 [2] Microbial Electrochemical and Fuel Cells, Fundamentals and Applications, Keith Scott and Eileen Hao Yu, 2016, DOI 10.1016/C2014-0-01767-4
SECONDARY LITERATURE:
[1] Prescott's Microbiology, Joanne Willey and Linda Sherwood and Christopher J. Woolverton, 10th edition, 2017. (also earlier)
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
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