DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: Jarosław Myśliwiec, Katarzyna Matczyszyn
DEPARTMENT: Chemical Department
SCIENTIFIC DISCIPLINE: Chemical Sciences

COURSE CARD

Course name in Polish: Materiały zaawansowane w biofotonice
Course name in English: Advanced materials in biophotonics
Course language 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: NCQ100109W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	PRESENTATION	Exam	Oral presentation	
Number of ECTS points	**0**			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

Basic knowledge in the field of biology, chemistry, physics

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COURSE OBJECTIVES

C1 To familiarize the PhD students with trends in the development of sciences on the border of physics, biology and chemistry
C2 . Description of methods of the fabrication and analysis of materials used in biophotonics

PROGRAM CONTENTS

Form of classes – mixed forms (mix)		Number of hours
Mix1	Presentation of the laboratories for the preparation and studies of bio materials for applications in photonics	5
Mix2	Preparation of hybrid biological systems based on modified DNA, doped with metal nanoparticles or luminescent dyes	5
Mix3	Synthesis of nanoparticles with the use of living organisms, plants, fungi	5

	and bacteria.	
Mix4	Liquid crystal forms in biological systems	5
Mix5	Light scattering in biological colloidal suspensions	5
Mix6	Amplification of light in biological systems	5
	Total hours	30

TEACHING TOOLS USED
N1. Laboratory of nonlinear optics, spectroscopy and materials analysis - group work

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	student has a sound knowledge of basic subjects such as mathematics, physics, chemistry or others - has an advanced knowledge fundamental to a field relevant to his/her research, including the most advanced methods of research and verification of results achieved - has advanced knowledge of directional subjects in a given discipline or in interdisciplinary subjects - has knowledge at an advanced level of discipline and subject matter relevant to the field of research carried out, including the most recent research findings and scientific achievements
Skills	P8S_UW	student has scientific and technological skills relevant to methods and methodology of conducting scientific research and critical evaluation of the results obtained - is able to create and conduct independent research, including outside the educational institution - is able to creatively interpret the results obtained and to search for their application - is prepared to intensify research with commercial potential
Social competence	P8S_KKK	student is aware of the role of cooperation, including international cooperation, in the process of research and analysis of the results obtained - understands and accepts the functions of the doctoral student care in the process of research planning, implementation and analysis of research results

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
[1] Scientific articles on the subject of modern materials used in biophotonics
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
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