

**DOCTORAL SCHOOL OF WROCLAW 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: NCQ100195W

* 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	

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

Basic knowledge in the field of biology, chemistry, physics

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 and bacteria.	5

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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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