

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

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE:
DEPARTMENT

COURSE CARD

Course name in Polish: Biologiczne aspekty w nanotechnologii

Course name in English: Biological aspects in nanotechnology (BioNaM)

Course language Polish / English*

University-wide general course type*:

Specialized courses for PhD students receiving education in

discipline*:

1) specialized course in discipline:

Subject code: NCQ100177W

* delete as applicable

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

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of basic issues of genetics, organic chemistry, physical chemistry, molecular biology, genetic engineering

COURSE OBJECTIVES

C1. To familiarize PhD students with the current state of knowledge in the field of nanotechnology and its application in biology and medicine.

C2. Discussion of nanotools used in the diagnosis, imaging and treatment of cancer.

PROGRAM CONTENTS

Form of classes – lecture (Lec)		Number of hours
Lec 1,2	Characterization and division of nanotechnology	4
Lec 3,4	Nanomolecular diagnostics	4
Lec 5	Nanopharmaceuticals	2
Lec 6,7	Nanotechnology in biological therapies	4

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Lec 8,9	Nanocarriers in medicine and surgery	4
Lec 10	Ethical and safety aspects as well as legal regulations in nanomedicine	2
Lec 11,12	Worldwide development and commercialization of nanomedicine	4
Lec 13,14	Research and education in nanomedicine and the future of nanomedicine	4
Lec 15	Exam	2
	Total hours:	30

Form of classes – foreign language course (Lng)		Number of hours
Lng1		
Lng2		
Lng3		
..		
	Total hours:	

Form of classes – seminar (Sem)		Number of hours
Sem1		
Sem2		
Sem3		
...		
	Total hours:	

Form of classes – mixed forms (mix)		Number of hours
Mix1		
Mix2		
Mix3		
...		
	Total hours	

TEACHING TOOLS USED
N1. Lecture with audiovisual media. N2. N3.

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge Range and depth - completeness of the cognitive perspective and dependence	P8S_WG	Discusses the diseases that are treated using methods using nanoparticles.
Knowledge	P8U_W	Lists the tools used in

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Universal		nanotechnology; Lists the positive and negative aspects of the use of nanoparticles.
Skills Use of knowledge - problems solved and tasks performed	P8S_UW	Characterizes the techniques used in the diagnosis, imaging and treatment of cancer.
Skills		
Skills		
...		
Social competence		
Social competence		
...		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Kewal K. Jain Nanobiotechnology: Clinics in laboratory medicine, Saunders; 1 edition, 2012
- [2] Patrick Boisseau, Marcel Lahmani Nanoscience: Nanobiotechnology and Nanobiology, Springer; 1 edition, 2009 W.D. Callister,
- [3] Nanotechnology in biology and medicine: methods, devices, and applications, ed. by Tuan Vo-Dinh, CRC Taylor & Francis Group, 2007
- [4] Materials science and engineering: An introduction, Wiley, 1999
- [5] H.S. Malvaed, Nanostructured materials and nanotechnology, Academic Press, 2002

SECONDARY LITERATURE:

- [1] Optical properties and spectroscopy of nanomaterials - Jin Zhng Zhang, published by World Scientific Publishing Co. Pte. Ltd.
- [2] T. S. Sreepasad, A. K. Samal and T. Pradeep, NANO REVIEWS, vol 2, (2011).
- [3] Physical Properties of Nanomaterials, Juh Tzeng Lue, Encyclopedia of Nanoscience and Nanotechnology, Volume X: Pages (1-46).

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

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