


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
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 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Graduate study lecture - Nanomaterials: properties, synthesis, applications		13.3.0584	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia biomedyczna, analityka i diagnostyka chemiczna, chemia i technologia środowiska, chemia obliczeniowa
		specialization	wszystkie
Teaching staff			
prof. dr hab. inż. Adriana Zaleska-Medynska; dr inż. Anna Malankowska; dr inż. Beata Bajorowicz			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Lecture		classes - 30 h	
The realization of activities		tutorial classes – 25 h	
classroom instruction		student's own work – 10 h	
Number of hours		Total: 75 h - 3 ECTS	
Lecture: 30 hours			
The academic cycle			
2022/2023 summer semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
multimedia-based lecture		Final evaluation	
		Graded credit	
		Assessment methods	
		Written test with open-ended and closed-ended questions	
		The basic criteria for evaluation	
		written test: positive assessment from written test including the topics mentioned in the program contents of the lecture, the scale according to UG study regulations - oral test – supplement of the written test, only for the students which receive 40,50 % points from written test	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
Basic knowledge of chemistry			
B. Prerequisites			
none			
Aims of education			
Student will get acquaint with: properties of nanomaterials, synthesis nanomaterials on a laboratory and industrial scale, applications of nanomaterials.			
Course contents			

Topics of the lecture:

History of nanotechnology and nanomaterials. Definition construction and classification of nanomaterials. Physicochemical properties of nanomaterials. Synthesis nanomaterials on a laboratory and industrial scale. Physical and chemical methods for obtaining thin layers. Methods of characterization of nanomaterials. Technology of semiconductor materials. Optical properties of semiconductors and metals. Carbon nanostructures: nanotubes and graphene. Quantum dots. Applications of nanomaterials. Risks of nanomaterials.

Bibliography of literature

Literature required to pass the course

Ludovico Cademartiri, Goeffrey A. Ozin, Nanochemia, Podstawowe koncepcje, PWN, 2011

R.W. Kelsall, I.W. Hamley, M. Geoghegan, Nanotechnologie, PWN, 2008

Krzysztof Kurzydłowski, Małgorzata Lewandowska, Nanomateriały inżynierskie konstrukcyjne i funkcjonalne, PWN, 2011

Extracurricular readings

S. Suzuki (Ed.) Syntheses and Applications of Carbon Nanotubes and Their Composites, InTech, 2013

J. R. Gong (Ed.) New Progress on Graphene Research, InTech, 2013

The learning outcomes (for the field of study and specialization)

Knowledge

Students define and classify nanomaterials

Students know the basic physicochemical properties of nanomaterials

Students have knowledge in preparation methods of nanomaterials

Skills

Classifies preparation methods of nanomaterials

Student analyzes the properties of nanomaterials

Student develop methods for obtaining nanomaterials on a laboratory scale

Social competence

The Student understands the role of nanoscience and nanotechnology in the modern world

Contact

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