

Course title Wykład specjalizacyjny - Nanomateriały: właściwości, otrzymywanie i zastosowanie / Graduate study lecture - Nanomaterials: properties, synthesis and applications		ECTS code 13.3.0584	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Masters	Full-time studies	
Teaching staff Prof. dr hab. inż. Adriana Zaleska-Medynska			
Forms of classes, the realization and number of hours		ECTS credits 3	
A. Forms of classes, in accordance with the UG Rector's regulations lecture		classes - 30 h tutorial classes – 25 h student's own work – 10 h	
B. The realization of activities in-class learning			
C. Number of hours 30 h lecture		Total: 75 h - 3 ECTS	
The academic cycle First year, summer semester			
Type of course obligatory		Language of instruction Polish	
Teaching methods Lectures with multimedia presentation		Form and method of assessment and basic criteria for evaluation or examination requirements	
		A. Final evaluation, in accordance with the UG study regulations course completion (with a grade)	
		B. Assessment methods Written test with open-ended and closed-ended questions	
		C. The basic criteria for evaluation or exam requirements -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	
Required courses and introductory requirements Basic knowledge of chemistry			
Aims of education Student will get acquaint with: <ul style="list-style-type: none"> • 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

A. Literature required to pass the course

Ludovico Cademartiri, Geoffrey 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

B. 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

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