UNIWERSYTET GDAŃSKI

Course title	**ECTS code**
Wykład specjalizacyjny - Nanomateriały: właściwości, otrzymywanie i zastosowanie / Graduate study lecture - Nanomaterials: properties, synthesis and applications	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	**Language of instruction**
obligatory	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:

- 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, 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

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