



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

### Course

Field of study	Year/Semester
Materials Engineering	2/3
Area of study (specialization)	Profile of study
Nanomaterials	general academic
Level of study	Course offered in
First-cycle studies	polish
Form of study	Requirements
full-time	compulsory

### Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	15	
Tutorials	Projects/seminars	

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Grzegorz ADAMEK

Responsible for the course/lecturer:

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Wydział Inżynierii Materiałowej i Fizyki

Technicznej

ul. Piotrowo 3 60-965 Poznań

### Prerequisites

Knowledge: Basic knowledge of solid state physics, materials science and crystallography,

Skills: The ability to solve problems based on the acquired knowledge, the ability to obtain information from the indicated sources

Social competences: The ability to solve problems based on the acquired knowledge, the ability to obtain information from the indicated sources

### Course objective

Understanding the methods of modeling the properties of nanomaterials with special properties



### Course-related learning outcomes

#### Knowledge

The student should characterize the basic properties of nanomaterials, technological properties and factors influencing the functional properties of nanomaterials. K\_W04, K\_W08

#### Skills

The student is able to select the technology of production and processing of nanomaterials to their expected properties and applications K\_U01, K\_U11

#### Social competences

The student is able to cooperate in the group K\_K03

The student is aware of the importance of designing the properties of nanomaterials for the modern economy and society K\_K01, K\_K02

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Final test at the end of the semester, current knowledge verification - oral answers.

### Programme content

Possibilities of designing properties of nanomaterials - numerical methods of calculating phenomena occurring in solids: nanomaterials / nanocomposites: magnetics, materials reversibly absorbing hydrogen, biomaterials. Methods of producing nanomaterials.

### Teaching methods

1. Lecture: multimedia presentation, presentation illustrated with examples given on the blackboard.
2. Laboratory exercises, discussion and preparation of the results in the form of a report, formulation of conclusions concerning the issues discussed during the classes.

### Bibliography

#### Basic

1. M. Jurczyk, J. Jakubowicz, Nanomateriały ceramiczne. Wyd. Pol. Pozn. 2004
2. M. Jurczyk, J. Jakubowicz, Bionanomateriały, Wyd. Pol. Pozn. 2008
3. Artykuły przeglądowe.

#### Additional

R. W. Kelsall, Nanotechnologie, PWN 2009



### Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,0
Classes requiring direct contact with the teacher	34	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	15	1,0

<sup>1</sup> delete or add other activities as appropriate