COURSE DESCRIPTION CARD - SYLLABUS

Course name
Properties of nanomaterials [S1IMat1>WN]

Course

Field of study
Materials Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of physics, chemistry and materials science. Reasoning skills, use of information obtained from libraries and the Internet. Understanding the need for learning and acquiring new knowledge.

Course objective

1. Learn about the different groups of nanomaterials characterized by specific properties 2. Understanding methods for modeling properties of nanomaterials 3. Develop students" ability to solve simple problems related to selecting methods of obtaining nanomaterials and shaping their properties based on the obtained knowledge. 4. Shaping students" teamwork skills

Course-related learning outcomes

Knowledge:
1. student should characterize nanomaterials k_w03, k_w08, k_w10
2. student should characterize the basic processes of obtaining nanomaterials k_w08 k_w12, k_w14

Skills:

1. student can choose nanomaterials depending on their applications k_u01, k_u03, k_u05, k_u12, k_u14, k_u16, k_u21
2. student can propose the use of nanomaterials k_u01, k_u05, k_u13, k_u16
3. student is able to carry out research on nanomaterials k_u03, k_u04 k_u05

Social competences:
1. student understands the need for lifelong learning, can inspire and organize the learning process of others k_k01
2. student can cooperate in a group k_k03
3. student is aware of the role of nanomaterials in modern economy and society k_k02

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: Credit based on the didactic test (Evaluation Criteria: Less than 50% of points – ndst., 50,1-60% of points – dst, 60,1-70% of points– dst+, 70,1-80% of points – db, 80,1-90% of points – db+, 90,1-100% of points – bdb).
Laboratory: Credit on the basis of correct performance of project tasks implemented within the course.

Programme content

Characteristic of physicochemical, magnetic, eclectic, optical, endurance properties of nanomaterials. Possibility to design properties of nanomaterials. Methods of shaping the structure of nanomaterials.

Course topics

none

Teaching methods

1. Lecture: multimedia presentation.
2. Laboratory: project development, discussion, team work.

Bibliography

Basic
1. M. Jurczyk, J. Jakubowicz, Nanomateriały ceramiczne. Wyd. Pol. Pozn. 2004
2. M. Jurczyk, J. Jakubowicz, Bionanomateriały, Wyd. Pol. Pozn. 2008
3. R. Pampuch i inni, Nowe materiały węglowe w medycynie, PWN, Warszawa 1988.
4. J. Marciniak, Biomateriały w chirurgii kostnej, Wydawnictwo Politechniki Śląskiej, Gliwice 1992.
5. Leda H: Materiały w budowie maszyn i aplikacjach medycznych, Wyd. Politechniki Poznańskiej,2008
6. Nanomateriały inżynierskie konstrukcyjne i funkcjonalne. Red. K. Kurzydłowski, M. Lewandowska. PWN
Additional
1. National and foreign scientific journals in the field of nanomaterials

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	35	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00