COURSE DESCRIPTION CARD - SYLLABUS

Course name
Materials Science – properties and applications of materials

Course

Field of study
Engineering management

Year/Semester
1/2

Area of study (specialization)

Profile of study

Level of study
First-cycle studies

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
12	12	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Grzegorz Adamek

grzegorz.adamek@put.poznan.pl

Faculty of Materials Engineering and Technical Physics

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:
dr inż. Mikołaj Popławski

mikolaj.poplawski@put.poznan.pl

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Prerequisites

Basic knowledge of chemistry and physics. Ability to solve basic problems of science on the basis of existing knowledge, the ability to obtain information from identified sources. Understanding the need to broaden the competence, willingness to work together as a team.

Course objective

Provide students with basic knowledge of materials science and technology, to the extent specified by the content of the program relevant to the field of study. Development of students' ability to solve simple problems related to the choice of nanomaterials and analysis of the results of studies based on the gained knowledge.

Course-related learning outcomes

Knowledge

1. Basic knowledge about machine life cycle
2. Basic knowledge about industrial product life cycle
3. Basic knowledge about methods and techniques use in engineering problem dissolving in field of machine design and maintenance

Skills

1. To actively engage in solving the questions, independently develop and expand skills in field of machine design and maintenance.
2. To work together as a team, to discharge the duties assigned to the division of labor in a team, demonstrate responsibility for own work and the responsibility for the results of the team's work

Social competences

1. Is aware of product design is a system consisting of technical, economical and management problems
2. Is aware of other engineering aspects including environmental and responsibility for the decisions.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

In respect of lectures: on the basis of answers to questions about the knowledge assimilated in previous lectures or assessment based on a written test of knowledge
In respect of laboratory classes: on the basis of answers to questions and reports about the knowledge correspond to given theme

Programme content

Matter
Basics of materials design. Knowledge of engineering materials, their properties and applications
Design of structure, microstructure and properties of materials (crystallization, plastic deformation, recrystallization, heat treatment, phase transformations, diffusion, layers)
Mechanical properties, corrosion, wear resistance, fatigue.
Steel and iron based materials
Nanomaterials
Plastics and composites
Nanotechnology
Materials testing

Teaching methods

Lecture – presentations, Laboratory classes

Bibliography

Basic

Leszek. A. Dobrzański, Podstawy nauki o materiałach, Wydawnictwo Naukowo-Techniczne

Leszek. A. Dobrzański, Metaloznawstwo i obróbka cieplna, Wydawnictwo Naukowo-Techniczne

Skrypt: Materiały w Bodowie Maszyn red. Andrzej Barbacki, Wydawnictwo Politechniki Poznańskiej

Additional

Karol Przybyłowicz, Janusz Przybyłowicz, Materiałoznawstwo w pytaniach i odpowiedziach , Wydawnictwo Naukowo-Techniczne

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,0
Classes requiring direct contact with the teacher	24	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	46	1,5

[1] delete or add other activities as appropriate