



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materials science and elements of chemistry

Course

Field of study

Year/Semester

Logistics

2 / 3

Area of study (specialization)

Profile of study

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

part-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

16

10

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

Ph.D., Eng., Grzegorz Adamek

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Faculty of Materials Engineering and Technical
Physics

ul. Jana Pawła II 24, 61-138 Poznań

Prerequisites

The student starting this subject should have basic knowledge of the basics of physics and chemistry. He should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

Course objective

Providing students with basic knowledge of materials science and material technologies, within the scope defined by the curriculum content appropriate for the field of study. Developing students' skills in solving simple problems related to the selection of materials, distinguishing materials and analyzing the results of microscopic observations based on the acquired knowledge.



Course-related learning outcomes

Knowledge

1. Knows the basic issues of chemical transformations, materials science, commodity science and the strength of materials and their importance for industrial and logistic processes [P6S_WG_03]

Skills

1. Can use appropriate experimental and measurement techniques to solve the problem covered by the studied subject, including computer simulation within logistics and its specific issues and supply chain management [P6S_UW_03]

2. is able to identify changes in requirements, standards, regulations, technical progress and the reality of the labor market, and on their basis determine the needs of supplementing knowledge [P6S_UU_01]

Social competences

1. is aware of initiating activities related to the formulation and transfer of information and cooperation in the society in the field of logistics [P6S_KO_02]

2. is aware of cooperation and group work on solving problems within logistics and supply chain management [P6S_KR_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

In the scope of lectures: on the basis of answers to questions concerning the material assimilated at previous lectures - current activity or a written test after completing the lecture series. For laboratories: on the basis of the evaluation of the current progress in the implementation of tasks assessed by written work-reports

Programme content

-Material and its components.

Fundamentals of material design. Sources of information about engineering materials, their properties and applications.

Shaping their structure, microstructure and properties by technological methods (crystallization, plastic deformation, recrystallization, thermo-plastic treatment, phase transformations during heat treatment, diffusion, coatings and surface layers).

Working conditions and wear mechanisms (mechanical properties, resistance to cracking, fatigue, creep, corrosion, tribological wear).

Steels, casting iron alloys, non-ferrous metals and their alloys.

Nanoamaterials



Polymer and composite materials.

Material nanotechnologies

Materials testing methods.

Teaching methods

Lecture: multimedia presentation, illustrated with examples given on the board. Lab: Conducting research on metallographic microscopes

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 Budowie 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	60	2,0
Classes requiring direct contact with the teacher	26	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests, project preparation) ¹	34	1,0

¹ delete or add other activities as appropriate