COURSE DESCRIPTION CARD - SYLLABUS

Course name
Materials science with elements of chemistry

Course

Field of study
Management and production engineering

Year/Semester
1 / 1

Area of study (specialization)

Profile of study
general academic

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)
8	16	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
PhD Eng Grzegorz Adamek

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tel. 61 6653665

Faculty of Materials Science and Technical Physics

Jana Pawła II 24, 61-139 Poznań

Responsible for the course/lecturer:
PhD Eng Mikołaj Popławski

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Faculty of Materials Science and Technical Physics

Jana Pawła II 24, 61-139 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

Przekazanie studentom podstawowej wiedzy z materiałoznawstwa i technologii materiałowych, w zakresie określonym przez treści programowe właściwe dla kierunku studiów. Rozwijanie u studentów umiejętności rozwiązywania prostych problemów związanych z doborem materiałów, rozróżniania materiałów oraz analizy wyników obserwacji mikroskopowych w oparciu o uzyskaną wiedzę.

Course-related learning outcomes

Knowledge

As a result of the course, the student: has ordered and theoretically founded general knowledge of the structure and functions of nano- and microworld objects, has detailed knowledge related to selected issues of analysis of the properties of functional materials and processes in the nano-scale.

Skills

As a result of the conducted classes, the student should demonstrate the following skills (the student will be able to):

- select materials with appropriate physicochemical and design properties for laboratory and engineering applications

- obtain information from literature, databases and other sources, interpret them and draw conclusions, formulate and justify opinions

Social competences

As a result of the course, the student will acquire the competences listed below. Completing the course means that he is able to work independently and in a team on a given task, he shows responsibility in this work.

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: based on 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 changes 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

Wykład: prezentacja multimedialna, ilustrowana przykładami podawanymi na tablicy.

Laoratoria: Prowadzenie badań na mikroskopach metalograficznych

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	75	3,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	45	1,5

[1] delete or add other activities as appropriate