



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Selection of construction materials

### Course

Field of study

Mechatronics

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

dr inż. Katarzyna Niespodziana

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Faculty of Materials Engineering and Technical

Physics

ul. Piotrowo 3, 60-965 Poznań, CMBiN pokój 329

Responsible for the course/lecturer:

### Prerequisites

The student should have basic knowledge of materials science, material manufacturing techniques, chemistry, and physics. He should be able to think logically, using information obtained from the library and the Internet.

### Course objective

The aim of the course is to provide students with basic knowledge in selection of construction materials, within the scope defined by the curriculum content appropriate for the field of study.

Develop students' ability to solve simple problems related to the selection of materials for equipment, construction



## Course-related learning outcomes

### Knowledge

Basic knowledge of the principles of selection of engineering materials in the construction of machines and equipment.

Knowing the physical laws relating to the forces acting on materials, cases of materials loads and mechanisms of their destruction, wear and tear.

### Skills

Student can choose the right engineering material for the projected part of the device.

Using understanding of the identified sources of knowledge (list of basic literature) and gaining knowledge from other sources.

### Social competences

Student understands the need for lifelong learning, can inspire and organize the learning process of others.

Student is aware of the role of engineering materials in the contemporary economy and their importance to society and the environment.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

### Lecture

Passing on the basis of a written exam in the form of a didactic test consisting of 15 questions with different scores. Passing threshold of 51%.

### Projects

The skills acquired during the project classes will be verified by preparing and reporting on the project developed by the students and the discussion on the work.

## Programme content

### Lecture:

Basics of material selection, Ashby's maps. Weighted property method. Physico-chemical, magnetic, eclectic, optical properties of engineering materials. Endurance properties of engineering materials determined by static and dynamic testing. Hardness. Hardness as a criterion for the selection of structural steels - calculation and modeling of hardenability. Basic material consumption mechanisms. Corrosion and corrosion protection. Basics of material design.

### Projects:

Determining the working conditions of elements. Development of technical requirements. The choice of materials and their characteristics. Weighted property method.



## Teaching methods

Lecture: multimedia presentation

Projects: solving practical problems, searching for sources, working in a team, discussion

## Bibliography

Basic

Dobrzański L.: Podstawy nauki o materiałach i metaloznawstwo, WNT 2002

Ashby M., Jones D „Materiały inżynierskie cz 1. Właściwości i zastosowania” WNT 1995

Ashby M., Jones D „Materiały inżynierskie cz 2. Kształtowanie struktury i właściwości, dobór materiałów” WNT 1995

Additional

Dobrzański L. „Wprowadzenie do nauki o materiałach” Wyd. Politechniki Śląskiej 2007

Przybyłowicz K. „Metaloznawstwo” WNT 1996

## Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	35	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	40	1,0

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