



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Selection of construction materials [S1Mech1>DMK]

Course

Field of study
Mechatronics

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

3,00

Coordinators

Lecturers

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:

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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.

Course topics

none

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	3,00
Classes requiring direct contact with the teacher	35	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,00