



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materials Selection in Product Manufacturing

### Course

Field of study

Mechanics and Machine Building

Area of study (specialization)

IP

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 st., 60-965 Poznań

Responsible for the course/lecturer:

### Prerequisites

The student should have basic knowledge of materials of metal and polymer materials and their properties.

### Course objective

Student should obtain knowledge about the principles of selection of construction materials and the possibility of their use for structural elements.

### Course-related learning outcomes

Knowledge

The student should characterize the principles of material selection.



Student should know how to determine the material properties appropriate for selected item.

The student can formulate the most important principles of selecting engineering materials, including technological aspects.

#### Skills

Student is able to choose the material for the production of a specific product.

Student is able to compare the properties and applications of various metal and plastic materials

#### Social competences

The student is aware of the role of construction plastics in the economy and human life.

The student is able to define priorities in the product design procedure.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

##### Lecture

Written colloquium at the end of the semester, contains open questions (credit in case of obtaining at least 50,1% correct answers).

##### Laboratory classes

Passing on the basis of written tests and oral answers of all performed laboratory meetings. All laboratory exercises must be passed with positive note.

#### Programme content

##### Lecture

1. Construction materials and their application.
2. Criteria for selection of construction materials.
3. Selection of materials in the design of structural elements.
4. Selection of material safety factors in responsible applications.

##### Laboratory

1. Identification of materials based on qualitative and quantitative methods.
2. Examination of mechanical properties of plastics.
3. Sieve analysis of foundry sands.
4. Testing of casting wax properties.

#### Teaching methods



Lecture: multimedia presentation illustrated with examples given on a board.

Laboratory classes: performing experimental procedure of testing of materials properties, solving tasks, discussion, teamwork.

### Bibliography

#### Basic

1. Ashby M.F., Jones D.R.H., Materiały inżynierskie, Tom 1. Właściwości i zastosowanie. Wydawnictwa Naukowo-Techniczne, Warszawa 1997.
2. Ashby M.F., Jones D.R.H., Materiały inżynierskie, Tom 2. Kształotowanie struktury i właściwości, dobór materiałów. Wydawnictwa Naukowo-Techniczne, Warszawa 1998.
3. Dobrzański L.A., Podstawy nauki o metalach i metaloznawstwo: materiały inżynierskie z podstawami projektowania materiałowego. Wydawnictwa Naukowo-Techniczne, Warszawa 2002.
4. Dobrzański L.A., Wprowadzenie do nauki o materiałach. Wyd. Polit. Śląskiej, Gliwice 2007.
5. Garbarski J. i in.: Części maszyn z tworzyw sztucznych, Oficyna Wydawnicza Politechniki Warszawskiej, W-wa, 2016.
6. B. Łączyński: Nietalowe elementy Maszyn. WNT, 1998, W-wa
7. Dobrzański L.A., Zasady doboru materiałów inżynierskich z kartami charakterystyk. Wyd. Polit. Śląskiej, Gliwice 2001.

#### Additional

1. W. Surowiak, H. Chydzki: Tworzywa sztuczne w budowie maszyn, WNT, W-wa
2. Łączyński B., Nietalowe elementy maszyn, Wydawnictwa Naukowo-Techniczne, Warszawa 1988.
3. Dobrzański L.A., Metalowe materiały inżynierskie. Wydawnictwa Naukowo-Techniczne, Warszawa 2004.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	25	1,0

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