



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materials Science

Course

Field of study

Electromobility

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Tutorials

Laboratory classes

15

Projects/seminars

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Maciej Tuliński

e-mail: maciej.tulinski@put.poznan.pl

Wydział Inżynierii Materiałowej i Fizyki

Technicznej

ul. Jana Pawła II 24, 60-965 Poznań, room 329

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics and chemistry. Logical thinking, exploring of various sources of knowledge. Understanding of necessity of learning and acquisition of new knowledge.



Course objective

The aim of the course is to provide students with a general overview of the basic knowledge about the classification of materials, their structure, properties and applications.

Course-related learning outcomes

Knowledge

Has a basic knowledge of materials science covering types of materials used in engineering

Skills

Based on technical documentation and using appropriate methods, tools and materials he/she is able to produce standard electrical and electronic devices used in electromobility.

Social competences

He/she is aware of the need to use the knowledge of experts when solving engineering tasks that go beyond his competence

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures:

Credit given in writing at the end of semester, covering issues discussed in lectures (in order to receive a passing grade a minimum of half of a possible points must be earned).

Laboratory classes:

Credit given on the basis of oral or written tests in every individual laboratory class as well as on the basis of written reports of laboratory classes as required by the teacher. Final credit is given by all positive results of tests and reports.

Programme content

Lectures:

Introduction to material science. The main groups of materials: metallic materials, polymers, ceramics and composites. Basic properties of materials: mechanical, electrical and magnetic. The relationship between the structure of the material and its properties and application. Selected failure mechanisms of materials: cracking, fatigue, creep. Properties and examples of application of selected materials used in the automotive industry. The selected aspects of the selection of materials.

Laboratory classes:

1. Structure and properties of ferrous metal alloys
2. Structure and properties of non-ferrous metal alloys
3. Surface layers with special properties



4. Composite materials

5. Mechanisms of wear and destruction of engineering materials

Teaching methods

Lectures:

Multimedia presentation illustrated with examples given on a blackboard

Laboratory classes:

Exercises are performed individually with the help and supervision of the lecturer.

Bibliography

Basic

Blicharski M., Wstęp do inżynierii materiałowej, WNT, Warszawa, 2017

Ashby M.F., Jones D.R.H., Materiały inżynierskie tom. 1 i 2, WNT, 2004.

Dobrzański L., Materiały inżynierskie i projektowanie materiałowe. Podstawy nauki o materiałach i metaloznawstwo, WNT, Warszawa, 2006

Additional

Leda H., Współczesne materiały konstrukcyjne i narzędziowe, Wydawnictwo Politechniki Poznańskiej, Poznań, 1996

Leda H., Wybrane metalowe materiały konstrukcyjne ogólnego przeznaczenia, Wydawnictwo Politechniki Poznańskiej, Poznań, 1997

Leda H., Strukturalne aspekty własności mechanicznych wybranych materiałów, Wydawnictwo Politechniki Poznańskiej, Poznań, 1998

Blicharski M., Inżynieria powierzchni, WNT, Warszawa, 2013

Dobrzański L., Zasady doboru materiałów inżynierskich, Wydawnictwo Politechniki Śląskiej, Gliwice, 2001

Leda H., Kompozyty polimerowe z włóknami ciągłymi, Wydawnictwo Politechniki Poznańskiej, Poznań, 2000



Breakdown of average student's workload

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

¹ delete or add other activities as appropriate