



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction materials [S1IMat1>MK]

### Course

Field of study

Materials Engineering

Year/Semester

3/5

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

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

dr inż. Kamil Kowalski

kamil.kowalski@put.poznan.pl

### Lecturers

### Prerequisites

Knowledge of the field of metals, plastics, basics of ceramic materials, forming, casting Wiadomości z metaloznawstwa, tworzyw sztucznych, podstawowe wiadomości o materiałach ceramicznych, obróbce plastycznej, odlewnictwie, obróbce cieplnej. Necessary logical thinking skills, associating an image with a description. Understanding the need to learn and acquiring knowledge, systematic learning

### Course objective

Acquainting with the methods of meeting the requirements concerning the properties of materials used for products of high durability and reliability, working in extreme conditions.

### Course-related learning outcomes

Knowledge:

1. the student should know the requirements for materials used for construction elements - [k\_w09]
2. the student should know the characteristics of metal, ceramic and polymer materials - [k\_w08, k\_w10]

Skills:

1. student is able to choose the material and its heat treatment ensuring failure-free operation of the structure - [k\_u16, k\_u21]
2. the student can determine the cause of damage to machine parts - [k\_u01]

Social competences:

1. the student is able to work in a group - [k\_k03]
2. the student is aware of the problems resulting from the failure of devices - [k\_k02]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lectures: oral exam

Laboratory: Assessment based on oral responses in the content of each laboratory exercise according to the instructions of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade from the answers and the report).

### Programme content

Construction materials:

- classification;
- influence of producing methods on the structure and properties of materials;
- Application of construction materials.

### Course topics

Materials used in the construction of vehicles, airplanes, spacecraft and shipbuilding. Materials for fasteners, gears, rolling bearings, plain bearings, for operation at low and high temperatures. Specific properties of steel with nitrogen, shaping the properties of products by controlling thermo-mechanical and thermal treatment, hardening and tempering, controlled cooling with bainite.

### Teaching methods

1. Lecture: multimedia presentation with examples given on the blackboard.
2. Laboratory exercises: practical use of selected microscopic research techniques, discussion and preparation of the results in the form of a report, formulation of conclusions regarding the issues discussed during classes

### Bibliography

Basic

1. Van Vlack L.H. Elements of Materials Science and Engineering, Massachusetts, Adison Wesley Publishing Company 1989
2. Dobrzański L.A. Metaloznawstwo i podstawy inżynierii materiałowej , WNT Warszawa 1998.
3. Blicharski M. Wstęp do inżynierii materiałowej. WNT Warszawa 1998.

Additional

1. Flinn R.A., Trojan P.K. Engineering Materials and Their Application, Houghton Mifflin Company 1990 Boston

### Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00