



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modern Technical Alloys [S1IMat1>NST]

Course

Field of study

Materials Engineering

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

dr inż. Kamil Kowalski

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Lecturers

Prerequisites

Knowledge of engineering materials and manufacturing technologies. Logical thinking skills, using information obtained from the Internet. Understanding of acquiring knowledge and acquiring knowledge, systematic learning.

Course objective

To acquaint students with new alloys intended for elements 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. the student is able to obtain information from the literature, databases and other properly selected sources of materials engineering k_u01

2. the student is able to identify and formulate simple engineering tasks of a practical nature, characteristic of materials engineering, including in particular the selection of technology for materials, selection of materials for specific applications; define the working conditions of materials. k_u16
3. the student is able to select engineering materials, methods of shaping the structure and properties of materials for technical applications depending on the structure, properties and conditions of use k_u01 k_u214

Social competences:

1. the student is able to work in a group - [k_k03]
2. the student correctly identifies and resolves dilemmas related to the profession k_k05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lecture: written test

Laboratory: passing the theory during exercises and reports

Programme content

Advanced materials used in industry:

- influence of different manufacturing methods on the properties of materials.
- applications of advanced materials.

Course topics

Requirements for materials working in specific conditions.

Strengthening alloys.

Technologies of increasing the strength of steel.

High-strength alloys - titanium, aluminum, magnesium and beryllium alloys.

Low temperature resistant alloys.

Radiation resistant alloys.

Alloys with special physical and operational properties. Biomedical alloys.

Space materials and technologies.

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

F. Wojtkun, J.P. Sołncew „Materiały specjalnego przeznaczenia” Politechnika Radomska, Radom 2001

Additional

L. A. Dobrzański „Podstawy nauki o materiałach i metaloznawstwo” WNT 2002

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	35	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00