



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modern high strength alloys

Course

Field of study

Year/Semester

Material Engineering

1/2

Area of study (specialization)

Profile of study

MMTS

general academic

Level of study

Course offered in

Second-cycle studies

Polish

Form of study

Requirements

full-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

15

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

dr inż. Piotr Dziarski

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Wydział Inżynierii Materiałowej i Fizyki

Technicznej

ul. Piotrowo 3 60-965 Poznań

Prerequisites

Basic knowledge of materials science, physics, phase transformations and strength of materials. Logical thinking, self-learning, use of library and internet. Student is aware of the importance and understanding of non-technical aspects and results of engineering activities including its influence on the environment

Course objective

To teach students how to fulfil demands for properties of materials applied for products of high durability and reliability in extreme work conditions

Course-related learning outcomes

Knowledge



Student should know the factors influenced on strength of alloy. Student should know untypical high strength alloys

Skills

Student can select material which fulfil the high strength requirements. Student can propose method of increase of strength properties of alloy

Social competences

Student knows how to cooperate and work in teams assuming various roles within Student is aware of the importance of application of high strength alloys for modern constructions

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: oral examination

Laboratory: On the basis of a written or oral tests and written reports on the content of the program during exercises. In order to pass the exercises, a written tests and all papers must be counted as positive

Programme content

Mechanisms and methods of strengthening of alloys. Alloys applied for different products e.g. in vehicles, airplanes, ships and ect. Alloys applied for work at low and at high temperatures. Creation of products properties by controlled thermomechanical and thermal treatment, quenching and tempering, controlled bainitic quenching.

Teaching methods

Lecture: multimedia presentation.

Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic

1. Van Vlack L.H. Elements of Materials Science and Engineering, Massachusetts, Adison Wesley Publishing Company 1989
2. Flinn R.A., Trojan P.K. Engineering Materials and Their Application, Houghton Mifflin Company 1990 Boston

Additional

1. Dobrzański L.A. Metallurgy and Materials Science Principles (in Polish) WNT Warszawa 1998
2. Blicharski M. Introduction to Materials Science (in Polish) WNT Warszawa 1998.



Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	15	1,0

¹ delete or add other activities as appropriate