



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Surface engineering

Course

Field of study

Materials Engineering

Area of study (specialization)

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

elective

Number of hours

Lecture

15

Laboratory classes

Tutorials

Projects/seminars

15

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Adam Piasecki

Responsible for the course/lecturer:

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Faculty of Materials Engineering and Technical

Physics

ul. Piotrowo 3 60-965 Poznań

Prerequisites

Basic knowledge of chemistry, physics, materials science. Logical thinking, use of the information obtained from the library and the Internet. Understanding the need for learning and acquiring new knowledge

Course objective

The importance of surface engineering, manufacturing methods, testing and properties.

Course-related learning outcomes

Knowledge



1. The student should characterize the types and structure of the surface layer of the product and the methods of testing their properties. [K_W03, K_W11]
2. The student should characterize the methods of producing surface layers. [K_W08]
3. The student should characterize the basic mechanisms and types of wear of the surface layer of products [K_W08].

Skills

1. The student is able to select the material for the corrosive environment. [K_U01, K_U05, K_U16]
2. The student is able to assess the type and causes of the wear of the product's surface layer. [K_U01, K_U05]
3. The student is able to test the surface layer of the product. [K_U08, K_U18, K_U21]

Social competences

1. The student is able to work in a group. [K_K03]
2. The student is aware of the importance of surface treatment for the quality and durability of products, economy and society. [K_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: - credit on the basis of a test consisting of both open and test questions carried out at the end of the semester. Scale of estimate: 51-60% - dst(C), 61-70% - dst+(C+), 71-80% - db(B), 81-90% - db+(B+), 91-100% - bdb(A).

Laboratory classes: evaluation of student's knowledge necessary to prepare, and carry out tasks and evaluation of reports.

Programme content

Lecture: Characteristics of the surface layer of the material. Tribological wear. Potential and exploitation properties of surface layers. Methods and techniques of testing the properties of the surface layer of the material. Modern methods of producing surface layers and coatings.

Laboratory classes: 1. Tribological tests of surface layers. 2. Analysis of the worn surface. 3. Paint coating tests. 4. Tests of the chemical composition of the surface layers. 5. Corrosion resistance tests of surface layers.

Teaching methods

multimedia presentations

Bibliography



Basic

1. Burakowski T., Areologia. Podstawy teoretyczne, Instytut Technologii Eksploatacji – PIB / 2013.
2. Blicharski M., Inżynieria powierzchni, Wyd. PWN, 2021.
3. Młynarczyk A. Jakubowski J.: Obróbka powierzchniowa i powłoki ochronne. Wyd. PP 1998.

Additional

1. Klimpel A.: Napawanie i natryskiwanie cieplne. WNT Warszawa 2000.
2. Praca Zbiorowa. Poradnik Galwanotechnika. WNT Warszawa 2002.
3. Klimpel A.: Technologie laserowe. Wyd. Politechniki Śląskiej, Gliwice 2012.
4. Kula P.: Inżynieria Warstwy Wierzchniej. Wyd. Politechniki Łódzkiej, 2000
5. Burakowski T. Wierzchoń T.: Inżynieria powierzchni metali. WNT Warszawa 1995

Breakdown of average student's workload

	Hours	ECTS
Total workload	59	3,0
Classes requiring direct contact with the teacher	34	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	25	1,0

¹ delete or add other activities as appropriate