



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electroplating [S1MiTPM1>Galwano]

Course

Field of study

Materials and technologies for automotive industry

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

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

dr inż. Piotr Dziarski

piotr.dziarski@put.poznan.pl

Lecturers

Prerequisites

Basic knowledge of materials science and surface engineering.

Course objective

Learn about the techniques of applying electroplated coatings, their properties and methods of testing them.

Course-related learning outcomes

Knowledge:

1. Has a structured knowledge of chemistry and electrochemistry necessary to understand the basic phenomena occurring during the electroplating processes of automotive parts.
2. Has a structured knowledge of the formation of functional properties of the surfaces of materials used in the automotive industry and knows the operational problems of automotive products coated with electroplated coatings.
3. Has detailed knowledge of the study of decorative and protective properties of electroplated coatings.

Skills:

1. Can plan and conduct experiments related to the determination of decorative and protective properties of electroplating coatings used in automotive applications.
2. Can analyze, evaluate and solve problems related to the technology of manufacturing electroplating coatings on automotive parts.
3. Can apply the technologies of manufacturing electroplating coatings in the automotive industry to obtain certain properties.

Social competences:

1. Understands the need to acquire new knowledge in the field of electroplating of automotive parts.
1. Is able to cooperate in a group to analyze and solve technological and exploitation problems specific to electroplated vehicle parts.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written credit at the end of the semester (credit if at least 51% of the points are obtained).

Laboratory: Credit on the basis of a written test/ oral answer and written studies from the realized program content during exercises. In order to receive credit, the written test/ oral answer and all reports must be passed with a positive mark.

Programme content

Learn about the techniques of applying electroplated coatings, their properties and methods of testing them.

Course topics

Lecture:

1. Basic terminology of surface engineering.
2. Surface preparation for electroplating coatings.
3. Classification of electroplating coatings and their properties.
4. Electroplating coatings used in the automotive industry.
5. Test methods for electroplating coatings used in the automotive industry.
6. Evaluation of quality of electroplating baths and quality of electroplating coatings.
7. Environmental problems in the electroplating plant.

Laboratory:

1. Influence of surface preparation on the quality and properties of electroplating coatings.
2. Adhesion tests of electroplating coatings.
3. Evaluation of decorative properties of electroplating coatings.
4. Corrosion resistance of chromium and nickel coatings.
5. Electroplating coatings on automotive parts made of plastics.

Teaching methods

1. Lecture: multimedia presentation
2. Laboratory exercises: practical exercises, discussion and teamwork.

Bibliography

Basic:

1. praca zbiorowa, Poradnik galwanotechnika, WNT, 2004
2. red. Tkaczyk S.: Powłoki ochronne, Wydawnictwo Politechniki Śląskiej, 1998
3. Weber J.A., Socha J.: Podstawy elektroosadzania powłok metalowych, Monografie IMP, 2008
4. Budniok A., Łągiewka E.: Struktura, właściwości i metody badań materiałów otrzymywanych elektrolitycznie, Wydawnictwo Uniwersytetu Śląskiego, Katowice, 2009
5. Nawrat G.: Elektrochemiczne metody inżynierii powierzchni, Wydawnictwo Politechniki Śląskiej, 2010

Additional:

1. Blicharski M.: Inżynieria powierzchni, Wydawnictwa Naukowo-Techniczne, 2021
2. Dobrosz K., Matysiak A.: Powłoki ochronne w pojazdach samochodowych, Wydawnictwa Komunikacji i Łączności, 1986.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	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)	25	1,00