COURSE DESCRIPTION CARD - SYLLABUS

Course name
Manufacturing of surface layers by welding methods

Course

Field of study
Technical Physics

Year/Semester
III/6

Area of study (specialization)
-

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Artur Wypych

artur.wypych@put.poznan.pl

tel. 61 665 3561

Instytur Inzynierii Materiałowej

Wydział Inzynierii Materiałowej i Fizyki Technicznej

Responsible for the course/lecturer:

Prerequisites

Basic knowledge in the field of physics, materials science. Ability to think logically, use information from the library and the Internet. understanding of the need to learn and acquire new knowledge.

Course objective

Learn about methods and ways of producing top layers by welding methods. Understanding the properties and applications of such layers.

Course-related learning outcomes

Knowledge

1. The student should characterize the types of top layers produced by different welding methods. - [K_W02, K_W03, K_W07, K_W08]

2. The student should select the parameters of the process of making top layers by welding methods. - [K_W07, K_W10, K_W16]

3. The student should define the elements of the construction of the top layers produced by welding methods. - [K_W10, K_W12]

Skills

1. The student can operate welding equipment. - [K_U01, K_U05, K_U12]

2. The student can choose the initial conditions of the processes of making top layers. - [K_U08, K_U21]

3. The student is able to plan the processes of making top layers. - [K_U07, K_U09, K_U21]

Social competences

1. The student can cooperate in a group - [K_K01, K_K03, K_K04]

2. The student is aware of the role of top layer manufacturing processes by welding methods in the modern economy and society. - [K_K06, K_K07]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: pass on the basis of a colloquium consisting of 5 general questions (pass in case of correct answer to min. 3 questions: <3 = ndst, 3 = dst, 3,5 = dst+, 4 = db, 4,5 = db+, 5 = bdb) carried out at the end of the semester.

Programme content

1.Construction and operation of welding equipment.

2.Welding methods of surface layering by gas burner, MMA, TIG, MIG/MAG, microplasma and thermal spraying by flame, arc, supersonic, plasma, cold gas spraying (to be chosen by the lecturer).

3.Properties of connections of different materials.

4.Characteristics and classification of additional materials for welding.

5.Properties of top layers produced by different welding methods.

6.The role of parameters for the manufacture of top layers by incinerator methods in shaping the properties of layers.

7. Industrial applications using the surface protection by the discussed welding methods

Teaching methods

Multimedia presentation, presentation illustrated with examples given on the board, alternatively a remote process using a multimedia presentation and / or camera.

Bibliography

Basic

Napawanie i natryskiwanie cieplne, Klimpel A., WNT, Warszawa, 2000,

2. Maszyny i urządzenia spawalnicze, Dobaj E., WNT Warszawa, 1998.

Additional

1. Poradnik Inżyniera Spawalnictwo cz.1, Pilarczyk J., WNT, Warszawa, 2001,

2. Spawalnictwo, Ferenc K., WNT, Warszawa, 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	
Classes requiring direct contact with the teacher	30	
Student's own work (literature studies, ~~preparation for laboratory classes/tutorials~~, preparation for tests/exam, ~~project preparation~~) [1]	15	

[1] delete or add other activities as appropriate