COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modern technics of welding

Course

Field of study

Materials Engineering

Year/Semester

3/6

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

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznań,

Responsible for the course/lecturer:

Prerequisites

Basic out of physics, chemistry and material science. Logically thinking, take advantage of information acquire from library and the Internet. Want to study and new knowledge acquire understanding.

Course objective

Knowledge and understanding by the students the essence of modern techniques for welding due to the human factor, energy and economics. Awareness of the needs and direction of development in terms of modern welding technology due to reductions introduced heat, reducing the degree of mixing of the components and reducing the thickness of the surface layer.

Course-related learning outcomes

Knowledge

1. The Student should characterize the source of heat for welding due to the amount of heat generated [K_W12].

2. The Student should choose the bonding process parameters of the selected methods [K_W12].

3. The Student should define the kinds of connections produced welding methods [K_W12].

Skills

1. The student is able to handle modern welding equipment [K_U12].

2. The student can choose the initial conditions for welding processes using modern welding consumables [K_U16, K_U21].

3. The student is able to schedule tasks for the implementation of modern welding processes [K_U20].

Social competences

1. The student is able to work in a group [K_K03].

2. The student is aware of the role of modern materials joining processes in the modern economy and for society [K_K07].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: deduction on the basis of the final test consisting of 5 General questions (include in the case of the correct answers to 3 questions: < 3-ndst, 3-dst, 3.5-dst +, 4-4.5 db-db, 5-bdb) carried out at the end of the semester.

Laboratory: Passing on the basis of the answer oral or written from the scope of the content of each performed laboratory exercises, a report from each laboratory exercises according to the readings. Grading laboratories: all the exercises must be positive (positive response and reports).

Programme content

Lectures:

1. Structure and working principle of modern welding equipment.

2. Characteristics of heat sources of welding for selected modern power sources.

3. Modern welding consumables in the form of wires and powders.

4. Characteristics and classification of materials in addition to bonding.

5. Connection Properties and layer properties produced welding methods and modern face.

6. Bonding developments and benefits arising from the use of modern methods of bonding because of the human factor, energy and economics.

Laboratories:

1. Execution of welds using modern welding materials in the form of solid wires and powder.

2. Execution of weld overlay using modern materials in the form of solid powder and wire welding and powders.

3. The execution of welding methods face layers with the use of additional material in the form of powders.

4. The study of operating properties produced welds and surface layers.

5. Comparison of the results obtained with those obtained from the connectors using the commonly used additional materials.

Teaching methods

1. Lecture: multimedia presentation.

2. Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic

1. Spawanie zgrzewanie i cięcie metali, Klimpel A., WNT, Warszawa, 1999,

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

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	62	2,0
Classes requiring direct contact with the teacher	32	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate