COURSE DESCRIPTION CARD - SYLLABUS

Course name

Plastic working

Course

Field of study

Management and Production Engineering

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

8

Laboratory classes

8

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

The student has basic knowledge in the field of chipless technologies and about the machines and devices used in these technologies. In addition, he is able to obtain information from Polish and foreign literature and the Internet, is able to use the acquired knowledge to choose a strategy for choosing technology. Understands the need to learn, acquire and synergy of new knowledge and cooperation in virtual and concurrent design teams.

Course objective

Extention knowledge of selected chipless manufacturing technologies

Course-related learning outcomes

Knowledge

1. Student knows the issues regarding the conditions of metal forming in this area, the creation of defective products and methods of their use, tooling used for plastic working.

2. The student knows the methods of plastic working of metals broken down into the manufacture of parts and the operation of machines.

3. Has basic knowledge about the use of plastic working machines.

Skills

1. Student is able to identify technical problems in the field of plastic working processes and the use of machines and instrumentation.

2. Student is able to choose materials with properties that enable them to be shaped in the required conditions.

3. Student is able to select the appropriate technologies for the plastic working of products with the required properties.

4. Student is able to select machines for plastic working depending on the requirements of the assumptions.

Social competences

1. Student understands the need for continuous learning; can inspire and organize team members' learning process.

2. Student is able to interact and work in a team, taking on different roles in it.

3. Student is able to think and act in a creative and entrepreneurial way.

4. The student is open to discussion of technical issues.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Written test carried out at the end of the semester (credit if at least 50.1% of correct answers are obtained). Up to 50.0% - 2.0, from 50.1% to 60.0% - 3.0, from 60.1% to 70.0% - 3.5, from 70.1 to 80.0 - 4.0, from 80.1% up to 90.0% - 4.5, from 90.1% - 5.0.

Laboratory:

Crediting based on the oral or written answer regarding the content of each laboratory exercise, report on each laboratory exercise as instructed by the laboratory. In order to get a credit for the laboratories, all exercises must be passed (positive assessment of responses and reports).

Programme content

Lectures:

Basic theoretical information about plastic forming of metals and their alloys (plasticity conditions, shape deformation mechanism). Technological operations of shaping products from sheet metal (cutting, bending, stamping) and rods (forging, rolling, extrusion, drawing). Materials susceptible to plastic working. Change of material properties during shaped products by plastic working methods. General information about tool materials and technological lubricants. Defects in products and methods of use. Examples of technological processes.

Laboratories:

1. Characteristics of plastic working machines. Cutting metal sheets with guillotine shears and roller shears.

2. Stamping cylindrical and rectangular die using a hydraulic press.

3. Free upsetting with a drop hammer and die forging with a screw press and extrusion with a hydraulic press.

4. Longitudinal and transverse rolling by means of laboratory rolling mills.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board.

Laboratory: performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

1. Erbel S., Kuczyński K., Marciniak Z.:Obróbka plastyczna. Warszawa: PWN 1986.

2. Morawiecki M., Sadok L., Wosiek E.: Teoretyczne podstawy technologicznych procesów przeróbki plastycznej, Wyd. Śląsk, 1986

3. Z. Marciniak: KONSTRUKCJA TŁOCZNIKÓW, Ośrodek Techniczny A. Marciniak, Warszawa, 2002.

Additional

1. Erbel S.,Golatowski T.,Kuczyński K., Marciniak Z. i inni: Technologia obróbki plastycznej na zimno. Warszawa: SIMP-ODK 1983. Muster A.: KUCIE MATRYCOWE,

2. Muster A.: KUCIE MATRYCOWE Projektowanie procesów technologicznych, Oficyna Wydawnicza Politechniki Poznańskiej, Warszawa 2002.

3. Zalecenia do obróbki plastycznej metali. Instytut Obróbki Plastycznej ? Poznań.

4. M. Ustasiak, P. Kochmański: OBRÓBKA PLASTYCZNA Materiały pomocnicze do projektowania, Politechnika Szczecińska, Szczecin, 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
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