COURSE DESCRIPTION CARD - SYLLABUS

Course name
Tooling design in forming technologies [S1MiBM2>KOwTF]

Course

Field of study
Mechanical Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

Basic in the field of the basics of machine construction, production technology and material processing. Logical thinking, analyzing the occurring phenomena, using the knowledge obtained from scientific, technical and popular science literature. Understanding the need to learn and acquire new knowledge.

Course objective

Getting to know the principles of designing products manufactured by forming technologies in terms of the processability of their construction.

Course-related learning outcomes

Knowledge:
1. Has knowledge in the field of product design in accordance with the principles of technology and with the use of the basics of computer aided design.
2. Has knowledge of machines and technological devices, including the design of instrumentation and machines, construction and principle of operation of drives. He knows the issues of diagnostics, operation and ergonomics.
3. Has knowledge of materials science with elements of chemistry, including engineering materials - comparison of their structure, properties and applications. He knows the rules of selecting engineering materials, shaping their structure and properties.

Skills:
1. Can select and use manufacturing technology to shape the form, structure and products of products.
2. Can select machines and technological devices for the implementation of production machines, analyze and evaluate their justification from ergonomics tests, select subassemblies, plan and supervise maintenance tasks for the assessment of the reliable operation of machines and examine machine diagnostics based on the principles of vibroacoustics.
3. Can to plan and organize individual and team work.

Social competences:
1. The student is able to work in a group.
2. Can think and act in an entrepreneurial way.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test carried out on the end of the term (in case of a credit min. 50.1% correct). Up to 50.0% - unsatisfactory (2.0) = F, from 50.1% to 60.0% - Satisfactory (3.0) = E, from 60.1% to 70.0% - Satisfactory plus (3,5) = D, from 70.1 to 80 - Good (4.0) = C, from 80.1% to 90.0% - Good plus (4,5) = B, from 90.1% - Very good (5,0) = A.
Laboratories:
Passing on the basis of an oral or written answer concerning the content of each performed laboratory exercise, a report on each laboratory exercise according to the instructions of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade on the answers and passed reports).

Programme content

Lecture:
Processability of products shaped by metal plastic processing. Tooling classification. General principles of designing production equipment. Designing tooling for general-purpose presses (cutting off, punching, stamping, extruding, upsetting, forging) and equipment for specialized machines (thread rolling tools, profiling rolls, benders, press brakes, punches and dies for automatic presses). Tool construction materials. Methods of mechanization and automation of general-purpose machines. Occupational health and safety regulations in the construction of instrumentation.lan and organize individual and team work.
Laboratories:
Technological and strength calculations, simplified technical and economic analyzes necessary to develop the offer. Examples of the design process of equipment for shaping products from sheets and bars.

Course topics

none

Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board, solving problems.
Laboratories: performing experiments, solving problems, discussion, working in a team.

Bibliography

Basic:
1. Matysiak W. Plancak M., Terminologia obróbki plastycznej, Poznań 2021.
2. Matysiak W., Plancak M., Oprzyrządowanie do procesów obróbki plastycznej metali, wydawnictwo Politechniki Poznańskiej, Poznań, 2023.
3. Z. Marciniak: KONSTRUKCJA TŁOCZNIKÓW, Ośrodek Techniczny A. Marciniak, Warszawa, 2002.
4. M. Ustasiak, P. Kochmański: OBRÓBKA PLASTYCZNA Materiały pomocnicze do projektowania, Politechnika Szczecińska, Szczecin, 2004.
5. A. Muster : KUCIE MATRYCOWE, Projektowanie procesów technologicznych, Oficyna Wydawnicza Politechniki Poznańskiej, Warszawa 2002.

Additional:
1. Morawiecki M., Sadok L., Wosiek E.: Teoretyczne podstawy technologicznych procesów przeróbki plastycznej, Śląsk, Katowice, 1977
4. Erbel S., Golatowski T., Kuczyński K., Marciniak Z. i inni: Technologia obróbki plastycznej na zimno. Warszawa: SIMP-ODK 1983. Muster A.: KUCIE MATRYCOWE.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	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)	20	1,00