



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Clamping systems

Course

Field of study

Mechanical Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Tutorials

Laboratory classes

Projects/seminars

15

Other (e.g. online)

Number of credit points

Lecturers

Responsible for the course/lecturer:

dr inż. Remigiusz ŁABUDZKI

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Instytut Technologii Mechanicznej

Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

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Prerequisites

Basic knowledge of mechanics, basics of machine construction, machine technology.

Ability to: logical thinking, use information obtained from libraries, catalogs and the Internet

Course objective

Getting to know the methodology of designing clamping systems

Course-related learning outcomes

Knowledge

Student knows the basic methods, techniques, tools and materials used in the design of technological equipment, knows and understands the basic concepts and principles of the protection of industrial property and copyright

Skills

The student is able to obtain information from the literature, is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks

Social competences

Student is open to the implementation of information technologies in engineering activities, can independently develop knowledge in the subject, can act in a project team using computer systems supporting engineering works

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Passed on the basis of a written test consisting of 4 questions rated on a scale from 0 to 1.

Passing if a minimum of 2.4 points is obtained. Project: Credit based on a completed project

Programme content

Lecture:

The role of technological equipment in technological processes. Place and role of instrumentation in the technological process, specificity for various manufacturing techniques. Purposefulness and the need to use handles. Examples. Basic definitions and classification of object handles. Homing and fixing of the workpiece in the holder. Design of subject technological equipment. General guidelines for the design of handles (necessary documentation, course of action, construction rules and techniques, the use of computer techniques). Components of machining holders (retaining, retaining, prisms, mounting blocks, set blocks, drill sleeves, legs, bodies, fasteners, indexing mechanisms, drives, etc.), methods of their selection. Standard, catalog, pneumatic, hydraulic and mechanical elements. Necessary technological calculations: clamping forces, the influence of the determination on the accuracy of the workpiece, machining errors and division in the holders, design cost analysis and making handles. Fixing the workpiece in the holder, fixing and fixing the holders on the machine tool, and the tools relative to the holder. Selection of technological equipment and serial production. Overview of characteristic design



solutions for various machining methods. Instrumentation operation. Commercial (catalog) instrumentation. Directions and trends in the development of instrumentation (special holders, UPSs, folding holders, zero point systems, etc.).

Project:

1. Concept of building a selected clamping system for a mass-produced and unitary product.
2. 3D model of the tooling in the selected 3DCAD program
3. Analysis of machining forces and clamping forces.
4. Calculation inaccuracy of the clamping system
5. Tooling profitability analysis

Teaching methods

Lecture: multimedia presentation - leading, discussion

Project: each student presents a multimedia presentation of the progress of the project implementation, discussion

Bibliography

Basic

1. Feld M. Uchwyty obróbkowe, WNT, W-wa 2002
2. Dobrzański T. - Uchwyty obróbkowe, Poradnik konstruktora - WNT, Warszawa, 1987
3. Poradnik inżyniera. Obróbka skrawaniem t. II

Additional

1. Pietruszewicz W., Kwaczyński W., Nazzal A.: Projektowanie uchwytów obróbkowych specjalnych, Wyd. Politechniki Szczecińskiej, 2004
2. Manual User Inventor. Autodesk 2010
3. Manual User Solidworks 2009
4. P. Kęska: SolidWorks 2013. Modelowanie części. Złożenia. Rysunki. CADvantage, Warszawa 2013



Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	50	2,0
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