



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basic of Machin Design

Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

elective

Number of hours

Lecture

30

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

30

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr inż. Dariusz Torzyński

dariusz.torzynski@put.poznan.pl

Institute of Transport

Responsible for the course/lecturer:

Prerequisites

knowledge of: material strength, materials science, manufacturing techniques, mechanics, metrology;

skills: logical thinking, recording the structure in the form of technical documentation.

Course objective

Understanding the basics of an engineer's constructional knowledge, acquiring construction skills, acquiring the ability to apply basic sciences, strength, materials science and manufacturing techniques to shape objects, learning the general principles of building assemblies and machine elements.

1. Provide students with knowledge of the basics of machine design, within the scope defined by the program content appropriate for the field of study.

2. Developing students' skills:

- calculating and constructing elements and assemblies of machines,



- documentation and reading of technical documentation based on the acquired knowledge

machine engineering graphics,

- practical use of knowledge acquired in the following subjects: mechanics,

strength of materials, machine science, materials science.

3. Shaping students' teamwork skills

Course-related learning outcomes

Knowledge

Has basic knowledge of the basics of machine construction and the theory of machines and mechanisms, including mechanical vibrations.

Has basic knowledge of the standardized rules of recording structures and engineering graphics.

Has basic knowledge of the strength of materials, including the basics of the theory of elasticity and plasticity, stress hypotheses, calculation methods for beams, membranes, shafts, joints and other simple structural elements, as well as methods of testing the strength of materials and the state of deformation and stress in mechanical structures.

Has basic knowledge of manufacturing techniques used in the engineering industry, such as casting, forming, reducing and incremental machining, welding and other joining techniques, cutting, coating and surface treatments.

Skills

Can plan and carry out the process of constructing uncomplicated machinery units or machines and formulate requirements for electronic components and automatic control systems for industry specialists in mechatronic systems.

Can perform basic functional and strength calculations of machine elements such as traction, gear, friction, bearings, rolling and sliding gears, clutches, brakes.

Can prepare a technical descriptive and drawing documentation of an engineering task.

Social competences

Is ready to critically assess his knowledge and received content.

Is ready to critically assess his knowledge and received content.

Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam of the lecture, project execution.



Programme content

Concepts of construction, its modeling, description of features and principles, and the construction process; technical system and its functions. Characteristics of types of loads, definition of loads and formulation of appropriate strength conditions. Accuracy of machine elements. Connections - shaping and their calculation: soldered, welded, glued, riveted, key, pin, bolt, wedge connections, threaded connections, screw mechanisms, frictional and pressed connections; examples and application. Flexible elements: springs, rubber flexible elements.

Teaching methods

Lecture: presentation illustrated with examples given on the blackboard.

Project: solving practical problems, discussion.

Bibliography

Basic

1. Podstawy konstrukcji maszyn, praca zb. pod red. Zb. Osińskiego, PWN, W-wa, 1999.
2. Podstawy konstrukcji napędów maszyn, praca zb. pod red. B. Branowskiego, Wydawnictwo Politechniki Poznańskiej, Poznań, 2007.
3. Podstawy konstrukcji maszyn, praca zb. pod red. M. Dietricha, WNT, W-wa, 1999.

Additional

1. Collins J. Mechanical Design of Machine Elements and Machines John Wiley & Sons 2003
2. G. Pahl, W. Beitz.: Nauka konstruowania, WNT, W-wa, 1984.
3. L. Kurmaz, O. Kurmaz: Podstawy konstruowania węzłów i części maszyn, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2011.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	60	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	40	2,0

¹ delete or add other activities as appropriate