



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of machine design

Course

Field of study

Education in Technology and Informatics

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

compulsory

Number of hours

Lecture

26

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

15

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

DSc Eng. Michał Śledziński

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 Street, 61-138 Poznań

Prerequisites

Student has a fundamental knowledge in the field of mathematics, physics, mechanical engineering, engineering graphics and technical drawing, strength of materials and the manufacture and machining of engineering materials. Is able to plan time to carry out engineering tasks, plan and arrange self-education process, to formulate and prepare technical documentation, to extract information from the literature, spatial imagination abilities. Understands the need of and opportunities for continuous self-improvement, is able to cooperate and work in a team.

Course objective

Provide the knowledge of the basics of machine design, develop of skills in constructing machine elements and assemblies, creating the technical documentation, practical use of knowledge in



mechanics, strength of materials and engineering materials, create the ability to cooperate and work in a team.

Course-related learning outcomes

Knowledge

1. Has basic knowledge of general engineering construction principles of fields of studies associated with field of study. [K1_W10]
2. Knows basic models and numerical methods used to machine design proces. [K1_W10]
3. Knows principles of safety rules related to that work and the reliability of machine. [K1_W10, K1_W19]
4. Knows the basic machines, their parts, connections and assemblies composed of parts. [K1_W10]
5. Has basic knowledge of machine engineering construction to the extent enabling the preparation of engineering documentation. [K1_W09, K_W10, K1_W18]

Skills

1. Is able to design selected parts of machines for basic loads. [K1_U01, K1_U04, K1_U06, K1_U07, K1_U10]
2. Is able to solve technical problems according to the laws of mechanics with the use of a mathematical rules. [K1_U04, K1_U07]
3. Is able to design selected connections of machine parts for simple loads. [K1_U01, K1_U04, K1_U07, K1_U10]
4. Knows the principles of operation and operating conditions for basic parts of machine. [K1_U10]
5. Is able to develop documentation concerning the implementation of an engineering task in the field of the basics of machine design. [K1_U06]

Social competences

1. Understands the need of self-improvement to raise professional competences. [K1_K03]
2. Is able to identify priorities correctly in order to carry out a task defined by him or her or others. [K1_K07]
3. Is able to work responsibly on task assigned to him or her both on his or her own and as part of a team, assuming various roles. [K1_K01]
4. Follows the rules of professional ethics. [K1_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: exam from theoretical backgrounds and from practical applications of knowledge about machine design. Tutorials: test based on simple calculation tasks.



Project classes: assessment of individual projects concerned with the design of the simple mechanical assembly.

Assessment principles: grade based on obtained results. Positive grade after gaining a minimum of 50% of points for all types of classes.

Programme content

The importance of the basics of machine design in modern technology. Standardization, tolerance and fits. Classification, structure, functions, application and problems of constructing of mechanical joint: separable (screw, threaded, shaped joints), inseparable (welded, riveted joints), frictional (press-fit, clamp). Springs. Basic phenomena in machines: static and fatigue strength, creep, friction, structure stability. Design and construction of the shafts. General characteristics, application and design principles of mechanical transmissions. Design and construction of the clutch and brake.

Teaching methods

Lecture: multimedia presentation illustrated by examples given on a blackboard.

Tutorials: examples given on a blackboard, self-solved tasks, discussion.

Project: analysis of individual components of the project, discussion.

Bibliography

Basic

1. Osiński Z.: Podstawy konstrukcji maszyn. PWN Warszawa 2020.
2. Praca zbiorowa pod red. E. Mazanka: Przykłady obliczeń z podstaw konstrukcji maszyn, t. 1-2. WNT Warszawa 2008, 2009.
3. Knosala R., Gwiazda A., Baier A., Gendarz P.: Podstawy Konstrukcji Maszyn: ćwiczenia, WNT, Warszawa 2018.
4. Juchnikowski W., Żółtowski J.: Podstawy konstrukcji maszyn. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004.
5. Korytkowski B.: Podstawy konstrukcji maszyn. Projektowanie I. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2009.

Additional

1. Szopa T.: Podstawy konstrukcji maszyn. Zasady projektowania i obliczeń inżynierskich, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2012.



Breakdown of average student's workload

	Hours	ECTS
Total workload	135	5,0
Classes requiring direct contact with the teacher	60	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam, project preparation) ¹	75	3,0

¹ delete or add other activities as appropriate