



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of engineering structures

Course

Field of study

Technical Physics

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

20

Laboratory classes

Tutorials

Projects/seminars

15

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 Street, 61-138 Poznań

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics (mechanics in the field of statics, kinematics and dynamics) and mathematics (core curriculum for secondary schools, elementary level). The ability to solve elementary problems from the basics of engineering structures based on the acquired knowledge, the ability to obtain information from the indicated sources. Understanding the need to expand your competences, readiness to cooperate as part of the team.

Course objective

1. Provide students with basic knowledge of the basics of engineering structures, within the scope defined by the program content appropriate for the field of study
2. Developing students' skills:



- calculating and constructing simple elements and assemblies of machines,
 - documenting and reading simple technical documentation based on the acquired knowledge in the subject of engineering machine graphics,
 - practical use of knowledge gained from the subjects: mechanics and strength of materials,
3. Shaping students' teamwork skills.

Course-related learning outcomes

Knowledge

As a result of the conducted classes, the student will have knowledge in the following areas:

1. Can define the basic concepts of mechanical engineering structures within the scope of the program content appropriate for the field of study and provide simple and practical examples of their application in industry, services and everyday life. [K1_W07]
2. Can use the rules for the selection of structural connections. [K1_W10]
3. Can use the rules and guidelines for designing basic elements and assemblies of machines. [K1_W10]

Skills

As a result of the course, the student will acquire the following skills:

1. Can design simple machine elements (bolt, pin, axle, shaft), select and design simple construction connections (riveted, welded, key, screw). [K1_U07]
2. Is able to make a simple drawing documentation of the designed machine elements and their connections based on the knowledge acquired in the subject of engineering engineering graphics. [K1_U07]
3. Can select the material, perform basic strength calculations. [K1_U08]
4. Can identify a technical problem, on this basis can formulate simple conclusions from the obtained calculation results and the designed element or structural connection. [K1_U14]

Social competences

As a result of the conducted classes, the student will acquire the following social competences:

1. Can cooperate within a team, be open to mutual exchange of knowledge and skills, demonstrate responsibility for their own work and the results of the team's work. [K1_K01]
2. Acts in accordance with the basic ethical principles. [K1_K02], [K1_K07]
3. Actively engages in solving the problems posed, independently develops and broadens his competences



Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written credit, project evaluation.

Programme content

1. Basic principles of the design process, elements of the mechanism, characteristics of the types of loads, formulation of strength conditions.
2. Connections and their basic calculation: soldered, welded, glued; riveted, shape connections: key, bolt.
3. Thread connections.
4. Screw mechanisms: examples and application, design calculations.
5. Spring elements: springs, rubber spring elements.
6. Axles and shafts: design, materials for axles and shafts.
7. Bearings: plain and rolling. Clutches, types and principles of their selection.
8. Belt and gear transmissions.

Teaching methods

Lecture: presentation illustrated with examples given on the board, solving problems.

Project: individual student project work, 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	79	3,0
Classes requiring direct contact with the teacher	39	1,5
Student's own work (literature studies, preparation for test, project preparation) ¹	40	1,5

¹ delete or add other activities as appropriate