



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of Machine Design II

Course

Field of study

Year/Semester

Mechanical engineering

3/6

Area of study (specialization)

Profile of study

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Level of study

Course offered in

First-cycle studies

polish

Form of study

Requirements

part-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

14

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Tutorials

Projects/seminars

8

8

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Institute of Applied Mechanics

Division of Virtual Engineering

Jana Pawła II str. 24, 60-965 Poznań

Prerequisites

The student has basic knowledge in the field of mathematics, physics (mechanics in the field of: statics, kinematics and dynamics), strength of materials, engineering graphics and Basics of Machine Design I, after passing as part of the study program. The student has the ability to solve problems of the basics of machine construction based on their knowledge and ability to obtain information from specified sources



Course objective

Providing students with knowledge of the basics of machine construction, to the extent specified by the curriculum content specific to the field of study. Developing students' skills:

- calculating and constructing machine components and assemblies,
- production and reading of technical documentation based on knowledge gained in the subject of Fundamentals of Engineering Graphics
- practical use of knowledge acquired in the subjects: Fundamentals of engineering graphics, Machine science, Materials science with elements of chemistry, Mechanics and theory of mechanisms, Strength of materials and structures, Basics of Machine Design I

Course-related learning outcomes

Knowledge

Has detailed knowledge in the field of engineering graphics and graphics including elements of machine science and engineering graphics, elements and assemblies: shafts and axles, slide and rolling bearings, permanent and separable clutches, various types of brakes, gears, tension and friction gears, design algorithms, databases engineering in mechanical engineering.

Skills

1. Is able to develop documentation regarding the implementation of an engineering task in the field of mechanics and machine construction (construction, technology, organization) and prepare a text discussing the results of this task.
2. Is able to solve technical problems based on the laws of mechanics, in particular concerning machine elements and mechanical systems, analyze mechanical phenomena.
3. Is able to map and dimension machine elements. Able to design, taking into account strength calculations, shafts, gears, clutches and gear systems. Has the ability to construct typical machine components and assemblies based on the appropriate load model taking into account: surface pressures, stresses, friction effects, principles of fatigue strength.
4. Is able to select engineering materials for applications in mechanics and machine construction.
5. Is able to design and implement a simple device in accordance with the given specification, using appropriate methods, techniques and tools.

Social competences

1. Understands the need for lifelong learning.
2. Is able to properly define priorities for the implementation of the task specified by him or others.
3. Is able to think and act in an entrepreneurial manner.



Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam of the lecture, written exercises, passing the project

Programme content

Lecture: Mechanical gears (division, features, efficiency). Theory and basic meshing law. Tothing parameters. Involute teeth. Teeth shaping. Tooth correction. Types of tooth damage. Strength calculations for cylindrical and bevel gears. Designing shafts and axles. Rolling and plain bearings. Seal. Gears lubrication. The clutch. Circulation, chain, belt and other gears

Exercises: calculating shafts and axles, calculating couplings, calculating rolling bearings

Project: gearbox design

Teaching methods

Lecture with multimedia presentation. Blackboard exercises. Gearbox design

Bibliography

Basic

1. Dziama A. Michniewicz M. Niedźwiedzki A. – Przekładnie zębate, Wydawnictwo PWN 1995
2. Podstawy konstrukcji napędów maszyn (pod red. B. Branowskiego), Wydawnictwo PP, 2007
3. Osiński Z.: Podstawy konstrukcji maszyn. Warszawa, Wyd. Naukowe PWN, 2002.

Additional

1. Branowski B. – Wprowadzenie do projektowania , Wydawnictwo Naukowe PWN, Warszawa, 1998
2. Dietrich M. (Red.) Podstawy konstrukcji maszyn. Warszawa, WNT, 1999.
3. Skoć A., Spalek J. Markusik S.: Podstawy konstrukcji maszyn 2. Warszawa, WNT, 2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for tutorials, preparation for exam, project preparation) ¹	70	3,0

¹ delete or add other activities as appropriate