



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of machine elements and assemblies design

### Course

Field of study

Year/Semester

Transport

2/4

Area of study (specialization)

Profile of study

-

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

0

0

Tutorials

Projects/seminars

30

30

**Number of credit points**

7

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

Information from the classic notation of constructions, computer graphics, is able to develop assembly and executive documentation, can cooperate in a group while performing various roles.

### Course objective

Getting to know the principles of constructing typical connections used in machine construction, the principles of building elements and assemblies of machines and methods of their design. Mastering computer-aided design tools for typical elements and assemblies of machines.

### Course-related learning outcomes

Knowledge



The student has ordered and theoretically founded general knowledge in the field of key issues of technology and detailed knowledge in the field of selected issues in this discipline of transport engineering.

The student has a basic knowledge of patents, the copyright and related rights act and the act on the protection of personal data and technology transfer, in particular with regard to transport solutions.

#### Skills

The student is able - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools.

The student is able to design elements of means of transport using data on environmental protection.

#### Social competences

The student understands that in technology, knowledge and skills very quickly become obsolete.

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture exam, completion of projects and exercises.

#### Programme content

Basic concepts of methodologies for designing elements and assemblies of machines. Computer aided design. Getting to know the conditions and structure of the design process. Getting to know the methodology of designing bonded joints. Practical knowledge of the methodology of designing typical manual and non-coupled connections. Getting to know the methodology of designing axles, shafts, elastic elements. Designing for fatigue strength. Principles of selection of rolling and sliding bearings. Reminder of the principles of applying tolerances and fits. Designing gears and tie drives, couplings and brakes.

#### Teaching methods

Lecture. Multimedia presentation with examples

Classes: problem solving

Project: Individually assigned design task

#### Bibliography



Basic

1. Branowski B.(red) Podstawy konstrukcji napędów maszyn. WPP 2007
2. Osinski Z. (red) Podstawy Konstrukcji Maszyn. PWN Warszawa 2012
3. Praca zbiorowa pod red. M. Dietricha: Podstawy konstrukcji maszyn. Tom 3, WNT, Wa-wa, 1999
4. Osiński Zbigniew, Sprzęgła, PWN, Warszawa 1998
5. Dziama A., Michniewicz M., Niedźwiedzki A.: Przekładnie zębate. PWN, Wa-wa, 1989
6. Ochęduszek K.: Koła zębate, WNT 1985

Additional

1. Krawiec P. Domek G. Przekładnie cięgnowe z pasami klinowymi. WPP 2019
2. Niezgodziński M. E., Niezgodziński T.; Wzory, wykresy i tablice wytrzymałościowe, Wydawnictwo Naukowo Techniczne, 1996
3. J. Żółtowski, Podstawy Konstrukcji Maszyn, Oficyna Wydawnicza Politechniki Warszawskiej, 2002
4. R. Knosala, A. Gwiazda, A. Baier, P. Gendarz, Podstawy Konstrukcji Maszyn, WNT, Warszawa 2000
5. A. Dziurski, L. Kania, A. Kasprzycki, E. Mazanek, Przykłady obliczeń z Podstawy Konstrukcji Maszyn, Tom 1 i 2, WNT, Warszawa 2005

**Breakdown of average student's workload**

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 180   | 7,0  |
| Classes requiring direct contact with the teacher   | 90    | 3,5  |
| Student's own work (literature studies, preparation for tutorials, preparation for tests, project preparation) <sup>1</sup> | 90    | 3,5  |

<sup>1</sup> delete or add other activities as appropriate