



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction and exploitation of machines

### Course

Field of study

Logistics

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

15

Tutorials

Laboratory classes

15

Projects/seminars

Other (e.g. online)

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

The student starting this course should have basic knowledge of technical drawing, strength of materials



and technical mechanics. He should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

### Course objective

Understanding the structure and elements of the mechatronic system. Acquiring the skills of an interdisciplinary approach to issues related to machine design.

### Course-related learning outcomes

#### Knowledge

1. Student knows the basic issues of construction, technology and techniques related to design and production [P6S\_WG\_01].
2. Student knows the basic issues of mechanics, design and operation of machines [P6S\_WG\_02].

#### Skills

1. The student is able to apply appropriate experimental and measurement techniques, including computer simulation as part of logistics and its specific issues, and supply chain management to solve the problem covered by the studied subject [P6S\_UW\_03].
2. The student is able to choose the right tools and methods to solve the problem within logistics and supply chain management, and to use them effectively.[P6S\_UO\_02].
3. The student is able to identify changes in requirements, standards, regulations, technical progress and the reality of the labor market, and on their basis determine the need for supplementing knowledge [P6S\_UU\_01].

#### Social competences

1. The student is aware of initiating activities related to the formulation and transfer of information and cooperation in the society in the field of logistics [P6S\_KO\_02].
2. The student is aware of the cooperation and work in a group on solving problems within the scope of logistics and supply chain management [P6S\_KR\_02].

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: The knowledge acquired during the lecture is verified by one 60-minute test carried out during the 15th lecture. The test consists of 5 open-ended questions with different scores. Passing threshold: 50% of points.

Laboratory: Final test: open questions. Passing threshold: 50% of points.

### Programme content

Lecture:

Machine construction process, computer aided design. The essence of the mechatronic system, the basic elements of the system. Construction of actors, sensors, their functions and selection principles.



Structure of the design and construction process of the mechatronic device. Stages of mechatronic design. Design assumptions, system modeling, principles of designing mechanical, electronic and control systems, selection and construction of components. Examples of mechatronic constructions. Selection of components from catalogs. Application of computer simulation in design. Preparation of mechatronic equipment documentation.

Laboratories:

Designing of mechanical systems, selection and construction of components. Selection of components from catalogs. Application of computer simulation in design. Preparation of mechatronic equipment documentation.

### Teaching methods

Information lecture, problem lecture, talk.

Practical method — laboratory exercises.

### Bibliography

Basic

1. Osiński Z., Podstawy konstrukcji maszyn, Wydawnictwo PWN, Warszawa, 1999.
2. Heimann B., Gerth W., Popp K., Mechatronika. Komponenty. Metody. Przykłady, Wydawnictwo PWN, Warszawa 2001.
3. Gawrysiak M., Analiza systemowa urządzenia mechatronicznego, Wyd. Politechniki Białostockiej, Białystok 1997.
4. Skrzyszowski Z., Podnośniki i prasy śrubowe PKM – projektowanie, Politechnika Krakowska, Kraków 2005.

Additional

1. Uhl T., Projektowanie mechatroniczne zagadnienia wybrane, Kraków 2007.
2. Kurmaz L., Projektowanie węzłów i części maszyn, Kielce 2004.
3. Juchnikowski W., Żółtowski J., Podstawy Konstrukcji Maszyn – pomoce do projektowania z atlasem, Politechnika Warszawska, Warszawa 2004.



### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) <sup>1</sup>	20	1,0

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