



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to mechatronics

### Course

Field of study

Mechatronics

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

10

Laboratory classes

8

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

dr inż. Jarosław Adamiec

Responsible for the course/lecturer:

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tel. 61 665 2054

Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

### Prerequisites

Knowledge: physics, general mechanics, fundamentals of machine construction, engineering graphics, basics of electronics and electrical engineering

Skills: description of basic phenomena, construction of mechanical and electrical systems, analysis of technical and electrical documentation

Social competence: is aware of the responsibility for decisions made during the construction process

### Course objective

Learning the structure and components of the mechatronic system. .



### Course-related learning outcomes

#### Knowledge

1. knowledge of the origin and development of mechatronics
2. knowledge of the structure and operation of the sensors
3. knowledge of communication systems

#### Skills

1. identification of mechatronic systems
2. analyses of control systems used in mechatronic systems
3. diagnosing faults in mechatronic systems

#### Social competences

1. understands the impact of mechatronic systems on user safety
2. is aware of the environmental impact of mechatronic systems
3. is aware of the importance of non-technical aspects and effects of the engineer-mechatronics activities

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Short tests after the lecture. Testing from the lecture at the end of the semester. Oral answers from laboratory preparation and report.

### Programme content

Lecture: Introductory messages - definitions, interdisciplinarity, history. Construction of mechatronic systems - components and their role. Mechatronic system - examples. Sensorics - classification, construction and principle of operation. Actorics - classification, construction and principle of operation. Mechatronic drive - examples, construction and principle of operation. Communication network in a mechatronic system, e.g. AS-i (actuator - sensor - interface). Decision mechanism - examples, construction and principle of operation.

Laboratories: Sensorics. Actorics. Mechatronic drive. Communication network. Decision-making mechanism.

### Teaching methods

Lecture with a multimedia presentation. Laboratory handouts, laboratory workstations.

### Bibliography



Basic

1. Heimann B., Gerth W., Popp K.: Mechatronika, Komponenty, Metody, Przykłady, PWN, Warszawa 2001,,
2. Schmidt D.: Mechatronika, wydawnictwo REA, Warszawa 2002,
3. Świder J.: Sterowanie i automatyzacja procesów technologicznych technologicznych układów mechatronicznych, Wyd. Politechniki Śląskiej, Gliwice 2002.

Additional

1. Gawrysiak M.: Mechatronika i projektowanie mechatroniczne, Wyd. elektroniczne, Białystok 1997.
2. Urządzenia i systemy mechatroniczne, wydawnictwo REA, Warszawa 2009.
3. Olszewski M.: Podstawy mechatroniki, wydawnictwo REA, Warszawa 2006.

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	40	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	35	1,0

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