

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basis of mechatronics

Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

3/5

Profile of study

general akademik

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

10

Tutorials

Laboratory classes

10

Projects/seminars

Other (e.g. online)

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

Ph.D., Eng., Jarosław Adamiec

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Faculty of Mechanical Engineering

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. Knows issues concerning engineering issues (physics, chemistry, material science, manufacturing technologies, strength of materials, mechanics [P6S_WG_01])
2. Knows issues in the life cycle of products, equipment, objects, systems and engineering systems [P6S_WG_06].

Skills

1. Is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks, also by using methods and tools of information and communication [P6S_UW_04].
2. Is able to critically analyze the way of functioning and evaluate - in connection with Safety Engineering the existing technical solutions, in particular machines, devices, objects, systems, processes and services [P6S_UW_06].
3. Can identify changes in requirements, standards, regulations and technical progress and the reality of the labour market, and on their basis determine the need to supplement the knowledge [P6S_UU_01].

Social competences

1. is aware of the recognition of the importance of knowledge in solving safety engineering problems and continuous improvement [P6S_KK_02].
2. is aware of understanding non-technical aspects and effects of engineering activities, including its impact on the environment and related responsibility for decisions taken [P6S_KK_03].
3. is aware of professional behaviour, professional ethics and respect for diversity of views and cultures [P6S_KR_01].

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 news - definitions, interdisciplinarity, history. Structure of mechatronic systems - components and their role. Mechatronic system - examples. Sensorics - classification, structure and principle of operation. Actuators-classification, construction and principle of operation. Mechatronic drive - examples, construction and principle of operation. Communication network in mechatronic system e.g. AS-i (actuator - sensor -interface). Decision mechanism - examples, construction and principle of operation.

Laboratories: Sensorics. Actuators. 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	46	1,0
Classes requiring direct contact with the teacher	20	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests, project preparation) ¹	26	0,5

¹ delete or add other activities as appropriate