COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of automation [S1Mech2>PA1]

Course

Field of study
Mechatronics

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Mathematics in the field of set theory, complex numbers. Boolean algebra. Fundamentals of electrical engineering (RLC elements, electrical circuits) and mechanics (kinematics and dynamics of mechanical elements)

Course objective

Introduction to the basics of describing and designing binary systems.

Course-related learning outcomes

Knowledge:
Knows what are basic binary functions, combinational and sequential circuits
Knows methods of describing and implementing combinational and sequential functions on contact elements and logic gates. Knows other digital circuits/blocks.

Skills:
Is able to formulate a combinational or sequential control function in the form of a parameter table and equations and implement it using gates and contact elements.

Social competences:
Understands the need for lifelong learning; is able to inspire and organize the learning process of others
Is aware of the role of automation in the modern economy and its importance for the development of society and the environment
Is able to define priorities for the implementation of a specific task

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

ASSESSMENT: Assessment based on answers to 3 questions

Programme content

Introduction to automation. History. Signals in automation.
Boolean algebra. Combination logic functions, gates, contact elements. Sequential circuits. Methods of implementing binary functions on contact elements and logic gates. Familiarization with digital circuits.

Course topics

1. Basic concepts. History. Automation signals. Systems: open and closed automation, interference. Signals
2. Basics of Boolean algebra. Functions of 1. and 2. variables.
3. Realization of binary systems. Realization of any logical functions.
4. Sequential systems. Relay and its applications.
5. Basic elements and digital systems.
6. Examples.

Teaching methods

Lecture with presentations and examples, explanations using the blackboard.

Bibliography

Basic:
1. Głocki W., Układy cyfrowe, Wydawnictwo Szkolne i Pedagogiczne.
2. Barry Wilkinson, Układy cyfrowe, WKŁ, 20023 .

Additional:
1. Poradnik Mechatronika, wyd. REA [2015]

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50