



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of automation [N1Mech2>PA1]

### Course

Field of study  
Mechatronics

Year/Semester  
2/3

Area of study (specialization)  
–

Profile of study  
general academic

Level of study  
first-cycle

Course offered in  
Polish

Form of study  
part-time

Requirements  
compulsory

### Number of hours

Lecture  
8

Laboratory classes  
0

Other  
0

Tutorials  
0

Projects/seminars  
0

### Number of credit points

1,00

### Coordinators

### 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

Learning the principles of automation systems. Ability to formulate binary control tasks and determine truth tables and equations describing a binary system. Combination and sequential systems and their practical implementation. Learning the methods of implementing binary functions on contact elements and logical gates. Familiarization with digital systems.

### Course-related learning outcomes

Knowledge:

Knows what basic binary functions, combinational and sequential circuits are

Knows the methods of describing and implementing combinational and sequential functions on contact elements and logic gates. Knows other digital circuits/blocks.

Skills:

Can formulate a combinational or sequential control function and implement it on gates and contact

elements.

Social competences:

Understands the need for lifelong learning; can inspire and organize the learning process of other people

He/She is aware of the role of automation in the modern economy and its importance for society and the environment

Can 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:

PASSING: Passed on the basis of an examination consisting of 3 general 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. Introduction to automatics. History. Automation signals.
2. Basics of Boolean algebra. Functions of 2 variables.
3. Implementation of binary systems. Implementation of any logical functions.
4. Sequential systems. Relay and its applications.
5. Basic elements and digital systems.
6. Examples.

### Teaching methods

Lectures and presentations of models and simulations performed in the Matlab -Simulink environment

### 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	8	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	17	0,50