# STUDY MODULE DESCRIPTION FORM

| Name of the module/subject | Code |
|---|---|
| **Computer modelling of mechatronic systems** | **1010321261010326007** |

| Field of study | Profile of study (general academic, practical) | Year /Semester |
|---|---|---|
| **Electrical Engineering** | **(brak)** | **3 / 6** |
| Elective path/specialty | Subject offered in: | Course (compulsory, elective) |
| **Electrical Systems in Mechatronics** | **polish** | **obligatory** |

| Cycle of study: | Form of study (full-time,part-time) |
|---|---|
| **First-cycle studies** | **full-time** |

| No. of hours | No. of credits |
|---|---|
| Lecture: **2** Classes: **-** Laboratory: **-** Project/seminars: **-** | **2** |

| Status of the course in the study program (Basic, major, other) | (university-wide, from another field) |
|---|---|
| **(brak)** | **(brak)** |

| Education areas and fields of science and art | ECTS distribution (number and %) |
|---|---|
| **technical sciences** | **2 100%** |
| **Technical sciences** | **2 100%** |

## Responsible for subject / lecturer:

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## Prerequisites in terms of knowledge, skills and social competencies:

| | | |
|---|---|---|
| 1 | **Knowledge** | Basic knowledge of electrical circuit theory, control, computing and numerical methods. |
| 2 | **Skills** | Knowledge of the structure and operation of electrical systems and mechatronics. |
| 3 | **Social competencies** | Awareness of the need to broaden their competence, willingness to work together as a team. |

## Assumptions and objectives of the course:

Acquiring modern methods of design, testing and analysis of mechatronics and actuators electromagnetic and electromechanical devices. The acquisition of skills in computing package selected.

## Study outcomes and reference to the educational results for a field of study

### Knowledge:

1. He has the necessary knowledge for the description and analysis of mechatronic components and systems as well as the basic phenomena occurring in them - [K_W01+++ ]
2. It has a basic knowledge of numerical methods allow to solve simple tasks in the field of mechatronics engineering. Knows tools used to perform numerical computations and analysis and design of technical systems selected - [K_W02+++]

### Skills:

1. He can use the known methods and mathematical models and computer simulations to analyze and evaluate the performance of mechatronic components and systems - [K_U10+++ ]
2. It can be used properly chosen servants development environments for simulation, design and analysis of simple electrical and mechatronical systems - [K_U13 ++]

### Social competencies:

1. He can think and act in an entrepreneurial manner in the area of electrical engineering - [K_K04++]

## Assessment methods of study outcomes

Lecture
written exam

## Course description

Classification models of electromechanical transducers. General description of the models of disease. Mathematical models of electromechanical transducers and complex mechatronic systems. Regulators. Control systems with feedback. Methods of solving equations of state. Differential equations of the form write the loop and nodal electric circuits. Methods for solving nonlinear differential equations. Simulation algorithm electromechanical transducers operating conditions with two degrees of freedom.

## Basic bibliography:

1. B. Mrozek, Z. Mrozek, MATLAB i Simulink, W Helion, Gliwice, 2004.
2. R. Burden, J.D. Faires, Numerical Analysis, PWS Publishers, Prindle, Weber&Schmidt, 1985.
3. P. Krauze, Analysis of Electric Machinery, McGraw Hill Book Company, New York 1986.
4. M. Sobierajski, M. Łabuzek, Programowanie w Matlabie dla elektryków, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2005.

## Additional bibliography:

1. B. Baron, Metody Numeryczne w Turbo Pascalu, HELION, Gliwice 1995.

## Result of average student's workload

| Activity | Time (working hours) |
|---|---|
| 1. participation in class lectures | 30 |
| 2. participation in the consultation | 8 |
| 3. preparation for the completion of the lecture | 15 |

## Student's workload

| Source of workload | hours | ECTS |
|---|---|---|
| Total workload | 53 | 2 |
| Contact hours | 38 | 1 |
| Practical activities | 0 | 0 |