STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Mechanics and Mechatronics**		Code **1010321341010324775**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 4**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **1**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **1 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Elementary knowledge of electrical engineering, electronics, mechanics and automatics.
2	**Skills**	The ability to understand the phenomena of electromagnetic and mechanical
3	**Social competencies**	Consciousness the need to enhance knowledge and skills. Ability to comply with the rules applicable in the classroom lecture in a large group and the ability to communicate with the nearest environment and with lecturers

Assumptions and objectives of the course:

The main goal is to obtain knowledge of the basics of mechatronics. Introduction to the design and principle of work of mechatronic devices.

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

Knowledge:

1. Define the concepts of mechatronics, mechatronic system. Describe the role of sensor and actuator in the mechatronic system - [K_W12 ++]
2. Know the application of MEMS. Explain the principle of the selected electrostatic transducer. - [K_W12 ++]

Skills:

1. Describe the essence of mechatronic systems. - [K_U11 + K_U16 +]
2. Search of information from literature, databases, and other sources in field of mechatronics. - [K_U05 +++]

Social competencies:

1. Can deal with with selected mechatronic systems and demonstrate confidence in activities requiring knowledge of mechatronic devices. - [K_K02++ K_K06++]
2. Is aware of the importance of the work of his own and a willingness to comply with the principles of teamwork and shared responsibility for the tasks performed. - [K_K03+++]

Assessment methods of study outcomes

Lecture:
-assessment of knowledge and skills by the completion of a written test,
-continuous evaluation for each course (rewarding activity and quality of the expression).

Extra points for the activity in the classroom, and in particular for:
-discussion and proposition of additional aspects of the subjects,
- comments related to the improvement of teaching materials,
- quality and diligence of the developed reports

Course description

Definitions, purpose and scope of mechatronics. Mechatronic systems. Subsystems integration of mechanical, hydraulic, electrical and information technology in complex mechatronic systems. Sensors and actuators. Actuators electromagnetic, electrostatic, piezoelectric, pneumatic and hydraulic. Microelectromechanical systems (MEMS) microactuators, microsensors, the use of silicon technology. Electrostatic motors of linear and rotary motion.

Basic bibliography:

1. 1. Schmid D., Mechatronika, tłum. z niem. oprac. wersji pol. Olszewski M., Wyd. REA, Warszawa 2002,
2. 2. Heimann B., Gerth W., Popp K.: Mechatronika. Komponenty ? metody ?przykłady. Warszawa: Wyd. Nauk. PWN 2001
3. 3. Turowski J., Podstawy Mechatroniki, Wyd. WSHE, Łódź 2008

Additional bibliography:

1. 1. Bishop R. H.,The Mechatronics Handbook, Austin, Texas, CRC Press 2002
2. 2. Gad-el-Hak M. The MEMS Handbook, CRC Press 2006

Result of average student's workload

Activity	Time (working hours)
1. Lectures	15
2. Participate in the consultations on the lecture	4
3. Participate in the completing	10
4. Prepare for the completion	2

Student's workload

Source of workload	hours	ECTS
Total workload	25	1
Contact hours	30	1
Practical activities	0	0