

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Mechatronic Design</b>		Code <b>1010641261010640329</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 6</b>
Elective path/specialty <b>Mechatronics</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>2</b> Classes: <b>1</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Janusz Płotkowiak email: janusz.plotkowiak@put.poznan.pl tel. 61 665 22 54 Wydział Maszyn Roboczych i Transportu ul. Piotrowo 3, 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr inż. Jarosław Adamiec email: jaroslaw.adamiec@put.poznan.pl tel. 61 665 2254 Wydział Maszyn Roboczych i Transportu ul. Piotrowo 3, 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Fundamentals of machine design, electrical engineering basics, basics of computer science.
2	<b>Skills</b>	Independent formulation of a technical problem, write the structure complies with the principles of technical drawing.
3	<b>Social competencies</b>	Understanding the need to broaden their competence, willingness to cooperate within the team.
<b>Assumptions and objectives of the course:</b> Understanding the structure and elements of mechatronic systems. Acquisition of skills interdisciplinary approach to the issues related to the design of machines.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibration. - [K1A_W05]		
2. Has a basic knowledge of linear measurement methods, stress, strain, velocity, temperature and fluid streams measurement, including electrical methods of measurement. - [K1A_W14]		
3. Has an elementary knowledge of automation systems, microcontrollers, control algorithms, industrial robots, electronic navigation systems used in machines, wired and wireless communications in local area networks used in machines. - [K1A_W17]		
4. Is up-to-date with the latest trends in mechanical engineering. - [K1A_W18]		
5. Has a basic knowledge of the impact of technological change on the organization of social life, health and psyche of individuals in human-machine interactions. - [K1A_W21]		
<b>Skills:</b>		
1. Is able to browse catalogs and webpages of machine elements producers for ready parts to use in own projects. - [K1A_U15]		
2. Is able to plan and carry out the process of constructing simple assemblies or machines and formulate requirements for electronic and automatic control systems for industry professionals in mechatronic systems. - [K1A_U19]		
<b>Social competencies:</b>		

1. Understands the need and knows the possibilities of lifelong learning. - [K1A\_K01]
2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions. - [K1A\_K02]
3. Is aware of the importance of behavior in a professional manner, compliance with the rules of professional ethics and respect for cultural diversity - [K1A\_K03]
4. Has a sense of responsibility for one's own work and is willing to comply with the principles of teamwork and taking responsibility for collaborative tasks - [K1A\_K04]

### Assessment methods of study outcomes

Written test.

### Course description

The essence of the mechatronic system, the basic units of the system. Construction of actors, sensors and their functions and rules of selection. Transmission and signal processing. Create a model of the system. The structure of the process of design and engineering of mechatronic devices. Stages of mechatronic design. Conceptual design, system modeling, design principles of mechanical, electronic and control, selection and construction of components, Identification. Examples of mechatronic design.

#### Basic bibliography:

1. Heimann B., Gerth W., Popp K.: Mechatronika. Komponenty. Metody. Przykłady, PWN, Warszawa 2001,
2. Świder J., Wszolek J.: Metodyczny zbiór zadań laboratoryjnych projektowych ze sterowania procesami technologicznymi,
3. Gawrysiak M.: Analiza systemowa urządzenia mechatronicznego, Wyd. Politechniki Białostockiej, Białystok 1997.

#### Additional bibliography:

1. Pahl G.,Beitz W. :Nauka konstruowania , WNT Warszawa 1984.

### Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Own work with the material of the lecture	1
3. Consultation	1
4. Preparing to the exam	4
5. Exam	2
6. Preparing to participation in exercise classes	1
7. Exercise classes	15
8. Own work with the material of the classes	1
9. Consultation	1
10. Preparing to pass the test	4
11. Written test	2

### Student's workload

Source of workload	hours	ECTS
Total workload	62	2
Contact hours	51	2
Practical activities	0	0