

**COURSE SPECIFICATION**

Course code	full-time programme:	M#2-S1-ME-502
	part-time programme:	
Course title in Polish	Mechatronika	
Course title in English	Mechatronics	
Valid from (academic year)	2024/2025	

GENERAL INFORMATION

Programme of study	MECHANICAL ENGINEERING
Level of qualification	first-cycle
Type of education	academic
Mode of study	full-time programme
Specialism	all
Department responsible	Department of Mechatronics and Weapons Engineering
Course leader	Ryszard Dindorf
Approved by	dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering

COURSE OVERVIEW

Course type		programme-specific
Course status		compulsory
Language of instruction		English
Semester of delivery	full-time programme	Semester V
	part-time programme	
Pre-requisites		
Examination required (YES/NO)		NO
ECTS value		2

Mode of instruction		lecture	class	laboratory	project	seminar
No. of hours per semester	full-time programme	15		15		
	part-time programme					

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Has structured, advanced knowledge in the field of mechatronics, including detailed knowledge of the principles of operation and application of mechatronic, biomechatronic and micromechatronic devices.	MiBM1_W04





	W02	Has in-depth knowledge of the construction and design of mechatronic, biomechatronic and micromechatronic devices.	MiBM1_W06
Skills	U01	Is able to use knowledge in the area of mechatronic, biomechatronic and micromechatronic devices, as well as formulate and solve engineering tasks in these areas.	MiBM1_U01
	U02	Is able to cooperate and work in a team during the implementation of various mechatronic projects, and is also able to appropriately define priorities for the implementation of specific mechatronic tasks.	MiBM1_U20
Competence	K01	Is ready to critically evaluate existing mechatronic knowledge and the need to obtain new information both from the literature and from experts in the field of mechatronics.	MiBM1_K01
	K02	Is aware of the need to independently supplement and expand knowledge in the field of mechatronics and takes a critical approach to the knowledge acquired.	MiBM1_K03

COURSE CONTENT

Type of instruction lecture	Topics covered
lecture	Introduction to Mechatronics. Mechatronic Design. Robotronics. Biomechtronics and Bionics. Bionic Flexible Actuators. Biogrippers. Micromechatronics.
laboratory	1. Actuators – executive elements. 2. Sensors – transducers and measuring sensors. 3. Mechatronic systems ASi (Actuator-Sensor Interface). 4. Construction and control of mechatronic devices.

ASSESSMENT METHODS

Outcome code	Methods of assessment (<i>Mark with an X where applicable</i>)					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
U01					X	
U02					X	
K01						X
K02						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Positive pass on the final test. At least 50% of points.





laboratory	non-examination assessment	Positive pass on the course reports. The final grade is an arithmetic mean.
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OVERALL STUDENT WORKLOAD

ECTS weighting												
No.	Activity type	Student workload										Unit
		full-time programme					part-time programme					
1.	Scheduled contact hours	L	C	Lb	P	S	L	C	Lb	P	S	h
		15		15								
2.	Other contact hours (office hours, examination)	2		2								h
3.	Total number of contact hours	34										h
4.	Number of ECTS credits for contact hours	1,4										ECTS
5.	Number of independent study hours	16										h
6.	Number of ECTS credits for independent study hours	0,6										ECTS
7.	Number of practical hours	25										h
8.	Number of ECTS credits for practical hours	1										ECTS
9.	Total study time	50										h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	2										ECTS

READING LIST

1. Dindorf R.: Elastyczne aktuatory pneumatyczne. Monografia. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2013.
2. Dindorf R., Woś P.: Przetworniki i układu pomiarowe w systemach hydraulicznych i pneumatycznych. Monografie, Studia, Rozprawy M63. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2014.
3. Dindorf R., Woś P.: Developments of hydraulic power systems. Monografie, Studia, Rozprawy M72. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2016.
4. Dindorf R., Takosoglu J., Woś P.: Developments of pneumatic control systems. Monografie, Studia, Rozprawy M89. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2017.
5. Dindorf R., Takosoglu J., Woś P.: Bezpieczeństwo układów hydraulicznych i pneumatycznych. Monografie, Studia, Rozprawy M97. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2018.
6. Heimann, W. Gerth, K. Popp.: Mechatronika – komponenty, metody, przykłady. PWN 2001.
7. W. Bolton: Mechatronics. Longman, New York 1999.
8. Olszewski M (red): Podstawy mechatroniki. Rea, Warszawa 2006.
9. Turowski J.: Podstawy mechatroniki. WSHE, Łódź 2008.

