



## Subject card

Subject name and code	Advanced mechatronic systems in medicine , PG_00057882						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Hydrauliki i Pneumatyki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Ryszard Jasiński				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		0.0		0.0	30
Subject objectives	Familiarizing students with advanced mechatronic systems in medicine						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U08] He/she can formulate and verify hypotheses for simple engineering problems and research		The student is able to formulate and test hypotheses for simple engineering and research problems		[SU1] Assessment of task fulfilment		
	[K7_U04] He/she can use programming-communicative techniques concerning to the scope of engineering tasks		Student is able to use information and communication techniques appropriate to perform engineering tasks, including computer methods		[SU1] Assessment of task fulfilment		
	[K7_K03] He/she can analyze and realize given tasks proposing entrepreneur and creative activities		Student is able to analyze and carry out the assigned tasks, showing entrepreneurship and ingenuity in action		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	Prosthetic hand. Construction and working principle of respirators. Devices to support blood circulation (cardiovascular support, counterpulsation methods, peristaltic pumps, artificial heart). PLC programming and commissioning of mechatronic systems manipulators.						
Prerequisites and co-requisites	Basics of hydraulics and pneumatics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			56.0%		100.0%		

Recommended reading	Basic literature	<p>Heiman B., Gerth W., Popp K.: Mechatronika, metody, przykłady, tł. Gawrysiak M., Wydawnictwo Naukowe PWN, Warszawa, 2001</p> <p>Gawrysiak M.: Mechatronika i projektowanie mechatroniczne, Rozprawy Naukowe Nr 44, Polit. Białostocka, Białystok, 1997</p> <p>Schmid D. i inni: Mechatronika, ISBN 83-7141-425-0, Warszawa 2002</p> <p>Praca zbiorowa: Urządzenia i systemy mechatroniczne. Cz.2, Wydawnictwo REA, 2009</p> <p>Dindorf R., Wołkow J.: Systemy płynowe w inżynierii medycznej. Zakład Narodowy im Ossolińskich. Wrocław Warszawa Kraków. 1999.</p> <p>Pawlicki G.: Podstawy inżynierii medycznej. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa 1997.</p> <p>Podsędkowski L.: Roboty medyczne. Budowa i zastosowanie. WNT Warszawa 2010.</p>
	Supplementary literature	-
	eResources addresses	Adresy na platformie eNauczanie:
	Example issues/ example questions/ tasks being completed	Hand prostheses.Construction and working principle of respirators.Devices to support blood circulation.
Work placement	Not applicable	

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