



Subject card

Subject name and code	Robotics and haptics systems, PG_00057036						
Field of study	Mechatronics						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Mechatroniki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Mazur				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	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	45	10.0		45.0	100	
Subject objectives	The aim of the subject is to familiarize students with the construction, application and principle of operation of haptic systems used in robotics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W10] knows development trends and most important new achievements in technical sciences and science disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering and related: Informatics and Materials Engineering		knows developmental trends and the most important new achievements in the field of haptics solutions		[SW1] Assessment of factual knowledge		
	[K7_U02] potrafi przygotować opracowanie naukowe w języku polskim i krótkie doniesienie naukowe w języku obcym dotyczące szczegółowych zagadnień z zakresu Mechatroniki, a także – dziedzin nauk technicznych i dyscyplin naukowych: Inżynieria Mechaniczna oraz Automatyka, Elektronika i Elektrotechnika, i pokrewnych, właściwych dla mechatroniki, przedstawiające wyniki własnych badań naukowych		is able to prepare a scientific study in Polish and a short scientific report in a foreign language regarding detailed issues related to haptics in use for control of robots		[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_W06] has detailed, supported by the theory knowledge in terms of mechatronic design, mechatronic systems and machines, devices and process where they are used		has theoretically included detailed knowledge related to the design issues of devices using haptic solutions		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation		

Subject contents	<p>1. Basic knowledge about haptics and robotics</p> <p>2. Designing haptic systems</p> <p>3. Software</p> <p>4. Review of existing solutions</p>											
Prerequisites and co-requisites	Knowledge in the field of mechatronic design, automation and robotics, programming and vibration analysis.											
Assessment methods and criteria	<table border="1" data-bbox="448 548 1489 656"> <thead> <tr> <th data-bbox="448 548 794 584">Subject passing criteria</th> <th data-bbox="794 548 1141 584">Passing threshold</th> <th data-bbox="1141 548 1489 584">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 584 794 620">Test</td> <td data-bbox="794 584 1141 620">50.0%</td> <td data-bbox="1141 584 1489 620">60.0%</td> </tr> <tr> <td data-bbox="448 620 794 656">Report</td> <td data-bbox="794 620 1141 656">50.0%</td> <td data-bbox="1141 620 1489 656">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Test	50.0%	60.0%	Report	50.0%	40.0%
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Example issues/ example questions/ tasks being completed	<p>1. What is a haptic? 2. What are the differences between the sense of touch and the sense of sight? 3. Discuss the differences between kinesthetic and tactile sensors. 4. What is the difference between haptic devices whose construction is based on impedance and those based on admittance? 5. List the applications of haptic systems. 6. What frequency ranges can be used in haptic systems? 7. Types of drives used in haptic systems. 8. How is sliding control implemented? 9. What is image segmentation.</p>											
Work placement	Not applicable											