



Subject card

Subject name and code	Robotics and haptics systems, PG_00057036						
Field of study	Mechatronics						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
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	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	dr inż. Marek Chodnicki dr inż. Michał Mazur					
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						
Systemy robotyki i haptiki, WL, MTR, II st., sem. 3, letni 2022/23 (PG_00057036) - Moodle ID: 30127 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30127							
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_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			[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
	[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 haptic solutions			[SW1] Assessment of factual knowledge	
	[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 [SW1] Assessment of factual knowledge	

Subject contents	<ol style="list-style-type: none"> 1. Basic knowledge about haptics and robotics 2. Designing haptic systems 3. Software 4. Review of existing solutions 		
Prerequisites and co-requisites	Knowledge in the field of mechatronic design, automation and robotics, programming and vibration analysis.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Report	50.0%	40.0%
	Test	50.0%	60.0%
Recommended reading	Basic literature	<p>Janschek, Klaus. <i>Mechatronic systems design: methods, models, concepts</i>. Springer Science & Business Media, 2011.</p> <p>Hatzfeld, Christian, and Thorsten A. Kern. <i>Engineering haptic devices</i>. Springer London Limited, 2016.</p>	
	Supplementary literature	<p>Kaltenbacher, Manfred. <i>Numerical simulation of mechatronic sensors and actuators</i>. Vol. 2. Berlin: Springer, 2007.</p> <p>Eric Vezzoli, Chris Ullrich, Gijs den Butter, Rafal Pijewski. <i>XR Haptics, Implementation & Design Guidelines</i>. 2022</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		