

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mechatronics in transport, PG_00057112							
Field of study	Transport and Logistics							
Date of commencement of studies	February 2024		Academic year of realisation of subject		2023/2024			
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	1		Language of instruction		Polish			
Semester of study	1		ECTS credits		3.0			
Learning profile	general academic profile		Assessme	essment form		assessment		
Conducting unit	Department of Ship Manufacturing Technology, Quality Systems and Materials Science -> Faculty of Mechanical Engineering and Ship Technology							
Name and surname	Subject supervisor		prof. dr hab. inż. Wiesław Tarełko					
of lecturer (lecturers)	Teachers		prof. dr hab. inż. Wiesław Tarełko					
		dr hab. inż. Jerzy Kowalski						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	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		9.0		21.0		75
Subject objectives	The objective of the	subject is: with the basic	knowledge reg	parding the mod	dern me	chatron	ic systems us	sed in transport
	- to prepare students for design of specialized mechatronic systems used in a wide variety of transport units							

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U02] The student is able to plan and carry out research experiments in selected transport issues using various research methods	Student draws up a basic block scheme of the mechatronic system Student selects a physical phenomenon assured realizing the specified function by the mechatronic system sensor Student selects a physical phenomenon assured realizing the specified function by the mechatronic system actuator Student selects sensors assured realizing the specified function in the mechatronic system Student selects actuators assured realizing the specified function in the mechatronic system Student designs the mechatronic system realizing the specified function	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
	[K7_W02] The student has an extensive knowledge of modeling transport processes, including the knowledge necessary to describe and evaluate the functioning of selected elements of the transport system	Student presents examples of sensors and actuators application in the mechatronic systems used in means of transport etc. Student enumerates physical phenomena used in sensors and actuators of the mechatronic systems Student defines a sensor/an actuator and presents their taxonomy according to the preferred criteria	[SW1] Assessment of factual knowledge
	[K7_W04] The student has basic knowledge of IT and telecommunication systems in transport and in the area of control in transport systems	Student mentions essential reasons for integration of mechanical, electronic and informatics components in order to obtain the mechatronic system Student mentions basic components of the mechatronic system Student mentions fundamental types of the mechatronic systems Student presents a general characteristic, manufacture processes, and application examples of the microelectromechanical systems MEMS Student presents a general characteristic, manufacture processes, and application examples of the nanoelectromechanical systems NEMS	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents	Introduction to Mechatronics						
	Which devices can be considered as a mechatronic unit?						
	Do always mechatronization have a sense?						
	Mechatronic System						
	Classification of mechatronic systems						
	MEMS systems (general characteristics; technology; examples of applications)						
	NEMS systems (general characteristics; technology; examples of applications)						
	Physical phenomena used in sensors and actuators of mechatronic systems						
	Mechatronic sensors - classification systems						
	Mechatronic sensors used to measure mechanical, thermal and biochemical parameters						
	Mechatronic actuators						
	Selected systems of transport industry						
	Mechatronic design inspired by nature						
Prerequisites and co-requisites							
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	lectures - test	66.0%	51.0%				
	laboratory	51.0%	49.0%				
Recommended reading	Basic literature Robert Munnig Schmidt, Georg Schitter, Adrian Ranl Eijk, The Design of High Performance Mechatronics edition. IOS Press, 2014.		nitter, Adrian Rankers and Jan van nee Mechatronics 2nd revised				
		Bishop, Robert H., Mechatronics: an introduction. CRC Pres					
		De Silva, Clarence W., Mechatronics: an integrated approach. CRC Press, 2005					
		Onwubolu, Godfrey C., Mechatronics: principles and applications. Butterworth-Heinemann, 2005.					
	Supplementary literature	Rankers, Adrian M., Machine Dynamics in Mechatronic Systems. University Twente, 1997					
	eResources addresses	Adresy na platformie eNauczanie: Mechatronika w transporcie - Moodle ID: 37730 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37730					
Example issues/							
example questions/							
tasks being completed							
Work placement	Not applicable						

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