



Subject card

Subject name and code	, PG_00056133						
Field of study	Mechatronics						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		2.0		
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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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	Introduction to navigation and location systems used in mobile robotics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W11] has knowledge about the life cycle of mechatronic systems and objects		He has basic knowledge about the life cycle of mobile robots and their navigation systems.		[SW1] Assessment of factual knowledge		
	[K6_W10] has knowledge about development trends in the field of engineering and technology sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics, Electrical Engineering and Space Technologies, adequate for Mechatronics curse		has a basic knowledge of development trends in the field of navigation systems and the location of mobile robots		[SW1] Assessment of factual knowledge		
	[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)		can use properly selected tools to compare the solutions of navigation systems of mobile robots		[SU4] Assessment of ability to use methods and tools		
	[K6_U06] is able to identify and formulate specification of simple, practical engineering tasks, distinctive for mechatronics		is able to identify and formulate the specification of simple engineering tasks during the design and selection of components for navigation systems of mobile robots		[SU2] Assessment of ability to analyse information		
	[K6_W08] knows and understands design and production processes of elements and simple mechatronic devices		knows and understands the processes of designing and building navigation systems for mobile robots		[SW1] Assessment of factual knowledge		

Subject contents	1 Introduction - to discuss ways of moving robots with regard to kinematics wheeled robots2 Perception of a mobile robot3 Methods of locating mobile robots4 Collision Avoidance Methods5 Planning the trajectory of mobile robots		
Prerequisites and co-requisites	Knowledge and experience on Fundamentals of automatic control. Knowledge and experience in Informatics (sem. II, IV). Knowledge on Mechatronic systems components.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	60.0%	60.0%
	Team projects	100.0%	40.0%
Recommended reading	Basic literature	Kozłowski K.: Modelowanie i sterowanie robotów, PWN, Warszawa, 2003. Dulęba I.: Metody i algorytmy planowania ruchu robotów mobilnych i manipulacyjnych, EXIT, Warszawa, 2001 M. J. Giergiel, Z. Hendzel, W. Żyliński: Modelowanie i sterowanie mobilnych robotów kołowych. Wydawnictwo Naukowe PWN, Warszawa 2002. K. Tchoń, A. Mazur, I. Hossa, R. Dulęba: Manipulatory i roboty mobilne. Wydawnictwo PLJ, Warszawa 2000. T. Zielińska: Maszyny Kroczące. Podstawy, projektowanie, sterowanie i wzorce biologiczne. Wydawnictwo Naukowe PWN, Warszawa 2003.	
	Supplementary literature	J. Borenstein, Where am I - Systems and Methods for Mobile Robot Positioning.1996	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		