



Subject card

Subject name and code	Navigation systems in mobile robotics, PG_00056133						
Field of study	Mechatronics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Mazur				
	Teachers						
Lesson types	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_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		
	[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_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_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_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 course	has a basic knowledge of development trends in the field of navigation systems and the location of mobile robots			[SW1] Assessment of factual knowledge		

Subject contents	<p>Course content – lecture</p> <p>1 Introduction - to discuss ways of moving robots with regard to kinematics wheeled robots 2 Perception of a mobile robot 3 Methods of locating mobile robots 4 Collision Avoidance Methods 5 Planning the trajectory of mobile robots</p>		
Prerequisites and co-requisites	<p>Knowledge and experience on Fundamentals of automatic control. Knowledge and experience in Informatics (sem. II, IV). Knowledge on Mechatronic systems components.</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Team projects	100.0%	40.0%
	Midterm colloquium	60.0%	60.0%
Recommended reading	Basic literature		<p>Kozłowski K.: Modelowanie i sterowanie robotów, PWN, Warszawa, 2003.</p> <p>Dulęba I.: Metody i algorytmy planowania ruchu robotów mobilnych i manipulacyjnych, EXIT, Warszawa, 2001</p> <p>M. J. Giergiel, Z. Hendzel, W. Żyliński: Modelowanie i sterowanie mobilnych robotów kołowych. Wydawnictwo Naukowe PWN, Warszawa 2002.</p> <p>K. Tchoń, A. Mazur, I. Hossa, R. Dulęba: Manipulatory i roboty mobilne. Wydawnictwo PLJ, Warszawa 2000.</p> <p>T. Zielińska: Maszyny Kroczące. Podstawy, projektowanie, sterowanie i wzorce biologiczne. Wydawnictwo Naukowe PWN, Warszawa 2003.</p>
	Supplementary literature		J. Borenstein, Where am I - Systems and Methods for Mobile Robot Positioning. 1996
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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