GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056133		
Field of study	Mechatronics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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_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_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, 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 choosen tools to compare design solutions of elements and mechatronics systems according to given application and economic crtierions (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_W11] has a basic 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

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

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge and experience on Fundamentals of automatic control. Knowledge and experience in Informatics (sem. II, IV). Knowledge on Mechatronic systems components.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Team projects</td><td>100.0%</td><td>40.0%</td></tr><tr><td>Midterm colloquium</td><td>60.0%</td><td>60.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">J. Borenstein, Where am I - Systems and Methods for Mobile Robot Positioning.1996</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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