



## Subject card

Subject name and code	Automation and Robotics, PG_00060459						
Field of study	Mechanical and Naval Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
Education level	first-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	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Mohammad Ghaemi				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	9.0	9.0	0.0	0.0	36
	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	36		8.0		81.0	125
Subject objectives	The aim is to get acquainted with the basis of control theory and with the structures and elements of basic automation systems, as well as general information on the design of control systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions		The student is able to plan an experiment in the field of identification of basic control systems, using specialized equipment, conduct an interpretation of the results, and draw appropriate conclusions.		[SU4] Assessment of ability to use methods and tools		
	[K6_W06] possesses knowledge on automatics and robotics of mechanical systems		The student possesses knowledge in the field of basic control systems of mechanical control systems, including their operation, characteristics, parameters, and behaviour in both steady-state and transient states.		[SW1] Assessment of factual knowledge		

Subject contents	1. Introduction and basic concepts  2. Classification of control systems  3. Modeling of mechanical dynamical systems and description of their elements  4. Types of mathematical models of dynamical systems: differential equation, transfer function, block diagram, linearization  5. Transition function and time characteristics  6. Feedback closed-loop control system  7. Analysis of control systems in the plot of time and in the plot of frequency  8. Stability of linear control systems  9. Controllers														
Prerequisites and co-requisites	Prerequesties:  1. Mathematics  2. Physics														
Assessment methods and criteria	<table border="1" data-bbox="456 1066 1482 1193"> <thead> <tr> <th data-bbox="456 1066 794 1093">Subject passing criteria</th> <th data-bbox="794 1066 1142 1093">Passing threshold</th> <th data-bbox="1142 1066 1482 1093">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1093 794 1126">Laboratory</td> <td data-bbox="794 1093 1142 1126">50.0%</td> <td data-bbox="1142 1093 1482 1126">25.0%</td> </tr> <tr> <td data-bbox="456 1126 794 1160">Lecture</td> <td data-bbox="794 1126 1142 1160">50.0%</td> <td data-bbox="1142 1126 1482 1160">50.0%</td> </tr> <tr> <td data-bbox="456 1160 794 1193">Exercises</td> <td data-bbox="794 1160 1142 1193">50.0%</td> <td data-bbox="1142 1160 1482 1193">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	50.0%	25.0%	Lecture	50.0%	50.0%	Exercises	50.0%	25.0%
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Recommended reading	Basic literature  Supplementary literature  eResources addresses	Nise N. S., <a href="#">Control System Engineering</a> , 8th Edition, John Wiley & Sons Inc., 2019.  - Friedland B., <a href="#">Control System Design</a> , McGraw Hill Co., 1986.  - Ogata K., <a href="#">Modern Control Engineering</a> , 4th edition, Prentice-Hall, 2009.  - Raven, F. H., <a href="#">Automatic control engineering</a> , McGraw Hill Co., 1986.  Adresy na platformie eNauczenie:													
Example issues/ example questions/ tasks being completed															
Work placement	Not applicable														