



Subject card

Subject name and code	Automation and Robotics, PG_00045074						
Field of study	Ocean Engineering, Ocean Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
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	5	ECTS credits			4.0		
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 hab. inż. Marek Dzida					
	Teachers	dr hab. inż. Marek Dzida mgr inż. Damian Jakowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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	6.0		44.0		95
Subject objectives	Ability to solve problems in automatic marine control systems						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student is able to assess usefulness of typical methods and tools applied in engineering to select the proper method and tool for solving the simple problems			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W04] has a basic knowledge in IT, electronics, automation and control, computer graphics useful to understand the possibilities of their application in ocean technology	The student has the knowledge of methods and tools applied for design of control system [SU2] Ocena umiejętności analizy informacji			[SW1] Assessment of factual knowledge		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems	The student is able to formulate simple engineering problems and its specification in automatic control			[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Regulation of one variable, steady states, static characteristics of the circuit. Stability of a linear circuit. Regulators. Shaping the characteristics of the regulator Regulators selection due to the stability condition Nonlinear systems. Types of nonlinear systems, static characteristics. Shaping nonlinear static characteristics of connected members in series. Stability studies of a nonlinear system. Descriptive function method. An example of calculating a describing function. Testing the stability of the system by the method of describing the function Phase plane method. Examples. Isocline method. Limit cycles. Presentation of the differential equation in the form of a block diagram. Multidimensional control systems. Equations of state and observation. Stability of multidimensional systems. Methods of multivariate analysis of step response systems. Computer simulation digital and analog model. The role of robots in automation.						
Prerequisites and co-requisites	Basic knowledge of automation						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Passing test	50.0%			60.0%		
	Midterm colloquium	50.0%			40.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Friedland B.: Control System Design. MC Graw-Hill Company, 1986. 2. Nise N.S.: Control Systems Engineering. John Wiley and Sons Inc., 2000.
	Supplementary literature	Ogata K.: Modern Control Engineering. Prentice Hall of India, 1982.
	eResources addresses	Adresy na platformie eNauzanie: Automatyka (PG_00041780) Automatyka (PG_00041671) - Moodle ID: 21822 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=21822
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	