GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Construction and operation of mechatronic systems, PG_00055469		
Field of study	Mechatronics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
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 hab. inż. Ryszard Jasiński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	15.0	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	2.0	28.0	75

Subject objectives

The aim of the course is to acquaint students with the construction and operation of mechatronic systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] is able to formulate an algorithm, knows low and high level programming languages and appropriate IT tools for developing computer programmes to control mechatronic system	Student selects the basic elements (catalog) for the mechatronic system (actuators, sensors, control elements, drivers). Student designs manipulators of mechatronic systems. Student programs PLC controllers.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_U08] is able - according to a given specification - design, calculate costs and develop a simple device, object, system or process typical for mechatronics, using appropriate methods, techniques and tools	Student designs manipulators of mechatronic systems.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[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	Student has basic knowledge about development trends in the field of technical sciences and scientific disciplines: Construction and operation of machines, Mechanics appropriate for the field of Mechatronics studies. Student explains the structure and principle of operation of mechatronic systems.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W11] has knowledge about the life cycle of mechatronic systems and objects	Student has a basic knowledge of the life cycle of mechatronic devices, facilities and systems. Student explains the structure and principle of operation of mechatronic systems.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	Course content – lecture LectureConstruction of typical mechatronic systems. Functions of modules and elements of mechatronic systems. Principles of designing mechatronic systems that perform specific functions and meet given requirements. Basic calculations and rules for the selection of (catalog) elements for the mechatronic system (actuators, sensors, controls, drivers). Methods of assembling mechatronic elements (construction elements, connectors, cable routing, etc.). Principles of operation of mechatronic systems. Basics of programming the visualization of mechatronic system processes (SCADA). Laboratory PLC programming of the MAS-200 assembly system modules
Prerequisites and co-requisites	Fundamentals of automationBasics of hydraulics and pneumaticsElements of mechatronic systemsModeling of mechatronic systemsMechatronic design

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	56.0%	30.0%
	56.0%	30.0%
	56.0%	40.0%

Recommended reading

Basic literature	1. Heiman B., Gerth W., Popp K.: Mechatronika, metody, przykłady, tł. Gawrysiak M., Wydawnictwo Naukowe PWN, Warszawa, 2001 2. Gawrysiak M.: Mechatronika i projektowanie mechatroniczne, Rozprawy Naukowe Nr 44, Polit. Białostocka, Białystok, 1997 3. Schmid D. i inni: Mechatronika, ISBN 83-7141-425-0, Warszawa 2002
Supplementary literature	1. Catalogs of companies producing actuators, sensors, controllers (FESTO, SMC, Rexroth, Siemens, Simex)
eResources addresses	

Example issues/ example questions/ tasks being completed	
Practical activites within the subject	Not applicable

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