GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mechatronics, PG_00047603		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Optional subject group 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	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Automatic Control -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Piotr Fiertek	
	Teachers	dr inż. Piotr Fiertek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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	3.0	42.0	75

Subject objectives

Introduction to mechatronics and nanotechnology. Introduction to industrial automation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	The student learned the concepts associated with mechatronics - what is mechatronic design, the basic principles of mechatronic design. The student learned the basic measurement and regulation systems used in automation and mechatronics. The student got acquainted with the basic electrical components used in industrial automation and learned to read the electrical documentation. The student got to know the technological trends occurring in mechatronics. The student got acquainted with the issue of electromobility, with autonomous vehicles and ADAS systems. The student got to know the problem of construction and control (control and navigation) of flying robots.	[SW1] Assessment of factual knowledge
[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	The student learned about the methods of operation of sensors used in automation and mechatronics, including various types of vision sensors. The student got acquainted with the basics of intelligent energy, construction and operation of micro-mechatronic devices (eg MEMS sensors),	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td colspan="3">Basic concepts, Introduction to mechatronics. Directions of integration and classification of mechatronic systems. Designing mechatronic systems. Overview of sensors used in automation and mechatronics, including optical sensors (eg vision systems). Classification and overview of typical actuators including electrical, electromechanical and electromagnetic actuators as well as hydraulic and pneumatic actuators. Electric motor control, review of electrical devices used in industrial automation, reading electrical documentation, PLC programming, electromobility, autonomous vehicles and ADAS systems, elements of intelligent energy, micro-technologies (MEMS), aerial robots, navigation systems, predictive maintenance, industry 4.0</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">brak</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>Exam + presence (5%)</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Podstawy mechatroniki „ Turowski Janusz, 2008

2. P Marek Gawrysiak, „Mechatronika i projektowanie mechatroniczne”, Białystok 1997

3. „Podstawy mechatroniki” – Podręcznik dla uczniów średnich i zawodowych szkół technicznych Warszawa 2006

4. „Urządzenia i systemy mechatroniczne część 1“ Agnieszka Grzybek, red. Stanisław Grzybek Rea, Warszawa 2009</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">„Urządzenia i systemy mechatroniczne część 2“ Agnieszka Grzybek, red. Stanisław Grzybek, Warszawa 2009</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</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>
</table>

Document generated electronically. Does not require a seal or signature.