



Subject card

Subject name and code	Autonomous unmanned platforms, PG_00051489						
Field of study	Autonomiczne platformy bezzałogowe						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		English		
Semester of study	3		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Microwave and Antenna Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Łukasz Kulas				
	Teachers		dr hab. inż. Łukasz Kulas				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	0.0	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		0.0		0.0	45
Subject objectives	The subject covers theoretical issues related to the subject of autonomous and unmanned technologies, e.g. communication and navigation systems, the basics of construction, testing and simulation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W04] knows and understands, to an increased extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or other elements or programmable devices specific to the field of study, and organization of work of systems using computers or such devices		Student knows and understands in depth the principles, methods and techniques of programming devices using microprocessors, as well as the organization of work of systems using computers or these devices in the context of the construction, design and use of autonomous or unmanned platforms		[SW1] Ocena wiedzy faktograficznej		
	[K7_W03] knows and understands, to an increased 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		Student knows and understands in depth the structure and principles of operation of components and systems used in the construction and design of autonomous or unmanned platforms, as well as selected topics related to simulation, testing and validation methods of components of autonomous or unmanned systems (e.g. sensors, communication, navigation).		[SW1] Ocena wiedzy faktograficznej		

Subject contents	Course content – lecture 1. Applications and Example Implementation Scenarios for Autonomous Systems 2. Introduction to Autonomous Platforms 3. Sensors in Autonomous Platforms 4. Single-Board Control Systems 5. Data Processing and Management Systems and Cybersecurity 6. Data Buses 7. Wireless Communication Systems 8. Situational Awareness Systems 9. Autonomous Platform Simulation 10. Designing Autonomous Platforms in Real-World Applications 11. Navigation and Mission Planning 12. Localization Systems 13. Unmanned Vehicle Demonstrations		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	100.0%	100.0%
Recommended reading	Basic literature	1. B. Binnie, J.LeMieux, " <i>Introduction to unmanned systems: Air, ground, sea & space : technologies and commercial applications</i> ". Unmanned Vehicle University Press, 2013. 2. V. Gvozdeva, " <i>Intelligent technologies in unmanned systems</i> ". INFRA-M Academic Publishing LLC., 2021. http://dx.doi.org/10.12737/1083296 .	
	Supplementary literature	1. A. Gilli, M. Gilli. <i>Emerging Technologies: Unmanned Aerial Vehicles</i> . Oxford University Press, 2018. http://dx.doi.org/10.1093/oso/9780198790501.003.0044 .	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Basics of Autonomous Platform Design 2. Characteristics of Autonomous Sensors 3. What Control Systems Are Used in Autonomous Platforms? 4. Why Are Data Buses Used? 5. Classification of Autonomous Platforms 6. What Wireless Communication Systems Are Used in Autonomous Platforms? 7. What Is Autonomous Platform Simulation? 8. What Are Situational Awareness Systems?		
Practical activites within the subject	Not applicable		

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