



Subject card

Subject name and code	Unmanned Vehicle Technologies, PG_00069763						
Field of study	Informatics, Electronics and Telecommunications, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering, Space and Satellite Technologies, Automatic Control, Cybernetics and Robotics						
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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	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	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 46994 Technologie Pojazdów Bezzałogowych 2025/2026 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46994						
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	3.0	27.0	75		
Subject objectives	Detailed technical issues related to selected technologies currently used in industry, including commissioning, modification and integration, among others embedded systems, advanced wireless links, positioning systems, obstacle detection systems. The emphasis is placed on the ability to integrate subsystems with data processing and control systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	can design a typical unmanned system based on popular computing platforms (e.g., RaspberryPi) according to specifications, using sensors and communication modules			[SU1] Assessment of task fulfilment		
	[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	can use his knowledge of programming methods and techniques, and select and apply appropriate programming methods and tools in creating computer software or programming devices or controllers using microprocessors or programmable components or systems used to control unmanned systems' components			[SU1] Assessment of task fulfilment		

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		
	Course content – laboratory 1. Single-board computers for control systems 2. Wireless communication systems 3. M2M interfaces 4. Industrial sensors 5. Obstacle detection sensors 6. Navigation systems		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	performing laboratory exercises	50.0%	100.0%
Recommended reading	Basic literature	technical documentation of components and subsystems provided by manufacturers	
	Supplementary literature	technical standards	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Requirements for components resulting from the specificity of unmanned mobile platforms		
Practical activities within the subject	Not applicable		

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