GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Critical systems software testing, PG_00038896					
Field of study	Space and Satellite Technologies					
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025	
Education level	second-cycle studies		Subject group		Optional 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	Department of Intelligent Interactive Systems -> Faculty of Electronics, Telecommunications and Informatics					
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Bogdan Wiszniewski				
	Teachers	prof. dr hab. inż. Bogdan Wiszniewski dr inż. Adam Kaczmarek				

Lesson types and methods of instruction	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	0.0	0.0	45

Subject objectives	Present software development standards in force in the European space industry as well as methods and techniques for their implementation.		
Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U08	Student is able to select and apply the IT product quality assurance techniques adequate to the quality characteristics assumed for this product.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K7_K03] Can analyse and implement assigned tasks while maintaining high technical standards. Is able to work and interact in a group, taking on different roles. Adheres to the principles of professional ethics and respects the diversity of views and cultures.	Student can implement assigned tasks from the area covered by this course taking into account technical aspects as well as economic, cultural, ethical and legal conditions.	[SK5] Assessment of ability to solve problems that arise in practice
	K7_W12	Student has the knowledge on development of on-board software and terrestrial space systems, and on the software life cycle as defined in ECSS standards.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents	1. A systematic approach in the development of high quality IT systems. 2. ECSS standard series: "Space engineering – Software" oraz "Space product assurance - Software product assurance" 3. Life-cycle vs. testing cycle of software product. 4. Software validation, verification and testing (VVT) processes. 5. Planning of VVT processes. 6. Static analysis of software products. 7. Error, program and execution environment models. 8. Functional (black-box) testing strategies. 9. Structural (white-box) testing strategies
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	50.0%	40.0%
	Definition, performance and reporting of test results for a selected field of functionality (lab assignment)	50.0%	30.0%
	Documentation of the testing process according to the ECSS standard (projet assignment)	50.0%	30.0%

Recommended reading	Basic literature	1. Space engineering – Software, ECSS E ST 40C, 6 March 2009, European Cooperation for Space Standardization, ESA-ESTEC, http://ecss.nl/standards/ecss-standards-on-line/active-standards 2. Space product assurance - Software product assurance, ECSS-Q-ST-80C Rev.1, 15 February 2017, European Cooperation for Space Standardization, ESA-ESTEC, http://ecss.nl/standards/ecss-standards-on-line/active-standards
	Supplementary literature	1. Krawczyk., H., Wiszniewski, B.: Analysis and Testing of Distributed Software Applications, Research Studies Press, Wiley, Baldock, England, 1998 2. IEEE Software and Systems Engineering Standards, http://standards.ieee.org/findstds/standard/software_and_systems_engineering.html.
	eResources addresses	Adresy na platformie eNauczanie: Testowanie oprogramowania systemów krytycznych - zima'24 - Moodle ID: 19149 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19149

Example issues/ example questions/ tasks being completed	1. Life-cycle processes defined by the ECSS standard. 2. Quality attributes of critical systems; 3. FMECA/FMEA methods for analyzing critical system components; 4. Software testing strategies.
Work placement	Not applicable

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