



Subject card

Subject name and code	Research project II, PG_00054225						
Field of study	Space and Satellite Technologies, Space and Satellite Technologies						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Łubniewski					
	Teachers	dr hab. inż. Marek Moszyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	30.0	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	7.0		63.0	100	
Subject objectives	<p>The research project is aimed at preparing students for future work in a research team and teaching them to meet obligations resulting from the agreed schedule in a timely manner.</p> <p>The immediate goal of the research project is to carry out works in which the student or students will verify the research hypothesis set by the client. For this purpose, the project may require the implementation of a product, e.g. an application, device, and conducting appropriate research, analysis of the results, etc.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_W06	Student has in-depth knowledge of the state of research and use of outer space.	[SW3] Assessment of knowledge contained in written work and projects
	[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 work and collaborate in a group as part of a project team, playing various roles in it.	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness
	K7_U01	Student can obtain information from various sources required in the implementation of a project task, interpret them, as well as draw conclusions and formulate and justify opinions.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
K7_U03	Student can prepare a scientific study on detailed issues in the field of space and satellite technologies, as well as present the results of his own research.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
Subject contents	The client defines the research problem by entering the content of the project into the "Group and research project service" system. If the Client is a WETI employee, the topic should be of a research nature, i.e. contain a research hypothesis for verification. In the case of an external customer, it is allowed to define an application topic consisting in the production of a prototype / product, e.g. a device / application. Depending on the requirements of the external client, the project may require the implementation of an application solution (e.g. an application, a fragment of code) completed in whole or in part, which can be used in a company, organization, institution (i.e. it has the potential for this, has certain functional features, and not only experimental) and optionally includes research elements.		
Prerequisites and co-requisites	The obligatory result of a research project for projects with a research hypothesis is a report in the form of a publication formatted according to the IEEE template, prepared in English. For application projects, a report in the form of a patent application (application) is also allowed. In the case of a report in the form of a publication, the information about the Project Supervisor and his affiliation should be included in the "Acknowledgment" section. Interested Students can prepare, together with the Tutor / ETI staff / other people who participated in the research: 1. A scientific publication prepared in accordance with the editorial requirements of the intended place of publication (journal, conference), using a template, e.g. IEEE, Elsevier, Springer etc. Publication follows the procedures of the publishing house. Co-authors contribute creatively to the publication. 2. Patent application - depending on the requirements - in Polish or English. The report is required to include such elements as: 1. Definition of the problem and research hypothesis. 2. A state-of-the-art section summarizing existing solutions / results in the context of the problem under consideration. 3. Solution proposal. 4. Details of the solution, e.g. algorithm design, implementation, applied optimizations. 5. Experiments and research. 6. Discussion of the results and verification of the research hypothesis. If the project ends with a result that can be used in further research work of the department (including, for example, an application that was used for research, verification of the hypothesis) and if the University and the student express such a will, an agreement is concluded on the transfer of property rights to the results that have been obtained (at the end of the research project). Additional requirements may be formulated for project implementers for an external client.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	50.0%	100.0%
Recommended reading	Basic literature	materials related to the project being implemented	
	Supplementary literature	Project management literature i.e. Project Management Body of Knowledge.	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	The acquisition system of radioastronomy signals and its analysis. Craters on Mars searching algorithms. Air quality monitoring platform using satellite data.
Work placement	Not applicable