GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Space Applications of Advanced Information Technologies, PG_00050031		
Field of study	Space and Satellite Technologies		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Computer Architecture -> Faculty of Electronics Telecommunications and Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Proficz	
	Teachers	dr hab. inż. Jerzy Proficz	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	30.0	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	8.0	22.0	75

Subject objectives

The students are going to be introduces to practical skills related to the advances Information Technologies including High Performance Computing

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W04] Knows and understands, to an increased extent, processes occurring in the life cycle of equipment, objects and technical systems, including software systems.	The student gains knowledge related to a lifecycle of space and satellite software systems, including their maintenance.	[SW1] Assessment of factual knowledge
[K7_W06] Has well-ordered and extended knowledge on ICT in space and satellite engineering. Has well-ordered and extended knowledge about potential, methods and application areas of satellite remote sensing and Earth observation as well as about the structure of individual segments, principles of operation and applications of satellite navigation systems.	The student gains knowledge related to using advanced IT solutions along with space and satellite technologies.	[SW1] Assessment of factual knowledge
[K7_U07] Identifies and describes technical problems and is able to solve them choosing the relevant methods and tools. Is able to select and use the appropriate, also the advanced, IT solution for the specific problem in the field of space and satellite technologies.	The student can identify and describe a practical problem related to satellite data analysis using advanced IT methods (Big Data or HPC).	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Lectures: There are going to be presented modern technologies related to High Performance Computing in cluster architecture in Big Data, Cloud and MPI environments.

Project: Preparing an software application for one on presented technologies within context of the space/ satelite data.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Skills in C or similar programming language</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>70.0%</td><td>50.0%</td></tr>
<tr><td>Exam</td><td>51.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>B. Wilder, Cloud Archittecture Patterns, O’Reilly 2012
W. Gropp, E. Lusk, A. Skjellum, Using MPI: Portable Parallel Programming with the Message-Passing Interface (Scientific and Engineering Computation), The MIT Press 2014</td></tr>
<tr><td>Supplementary literature</td><td>T. White, Hadoop, The Definive Guide, O’Reilly 2012</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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