GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Satellite telecommunications, PG_00050017		
Field of study	Space and Satellite Technologies		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
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	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Radiocommunication Systems and Networks -> Faculty of Electronics Telecommunications and Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wojciech Siwicki	
	Teachers	dr inż. Wojciech Siwicki	

Lesson types and methods of instruction

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

Subject objectives

The aim of the course is to acquaint the student with the basic concepts related to satellite telecommunications, satellite link balance, properties of the terrestrial and satellite segments, transmission methods and multiplexing in the satellite channel and applications of satellite telecommunications (various systems, their organization and services), as well as the practical operation of selected radiocommunication systems

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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.	Has system knowledge of the construction and operation of a satellite radio link	[SW3] Assessment of knowledge contained in written work and projects
[K7_U05] Notices, when formulating and solving engineering tasks, their systemic and non-technical aspects, is able to plan and conduct experiments, including measurements and computer simulations, critically interprets the obtained results and draws conclusions. Is able to manage the work of a team.	Is able to use in practice the communication and location capabilities of INMRSAT, IRYDIUM and GPS systems.	[SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>lectures:

Basic definitions and terms related to satellite telecommunications. History of satellite telecommunications systems. Earth satellites orbits. Architecture of satellite systems. Satellite link balance. Description and properties of the ground segment. Description and characteristics of the satellite segment. Signal transmission methods. Methods of multiplying the transmission in the satellite channel. Applications of satellite telecommunications systems - description of various satellite systems, their organization and properties, and services offered.

Laboratory:
During the laboratory, the student will become familiar with the practical operation of selected satellite radiocommunication systems, including practical communication procedures using a satellite communication simulator.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Laboratory</td><td>100.0%</td><td>40.0%</td></tr>
<tr><td>Lecture exam</td><td>60.0%</td><td>60.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Zieliński R.J.: Satelitarne sieci teleinformatyczne. Warszawa: Wydawnictwo Naukowo-Techniczne 2016.

2. Kabaciński W.: Sieci telekomunikacyjne. Warszawa: Wydawnictwa Komunikacji i Łączności 2015.

3.Anil K. Maini, Varsha Agrawai: Satelite technology principles and applications. John Wiley&Sons Ltd. 2011.

4. ITU: Handbook on satelite communications. John Wiley & Sons Ltd. 2002.</td></tr>
<tr><td>Supplementary literature</td><td>1. Bem D.J.: Radiodyfuzja satelitarna. Warszawa: Wydawnictwa Komunikacji i Łączności 1990.

2. Wesołowski K.: Systemy Radiokomunikacji Ruchomej. Warszawa: Wydawnictwa Komunikacji i Łączności 2006.

3. Maral G.:VSAT Networks. John Wiley&Sons Ltd. 2002.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Not applicable</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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