



Subject card

Subject name and code	Satellite telecommunications, PG_00050017						
Field of study	Space and Satellite Technologies						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2024/2025		
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						
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_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		
	[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		

Subject contents	<p>lectures:</p> <p>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.</p> <p>Laboratory:</p> <p>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.</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 546 794 573">Subject passing criteria</th> <th data-bbox="799 546 1137 573">Passing threshold</th> <th data-bbox="1142 546 1481 573">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 580 794 607">Lecture exam</td> <td data-bbox="799 580 1137 607">60.0%</td> <td data-bbox="1142 580 1481 607">60.0%</td> </tr> <tr> <td data-bbox="456 613 794 640">Laboratory</td> <td data-bbox="799 613 1137 640">100.0%</td> <td data-bbox="1142 613 1481 640">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture exam	60.0%	60.0%	Laboratory	100.0%	40.0%
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Lecture exam	60.0%	60.0%										
Laboratory	100.0%	40.0%										
Recommended reading	Basic literature	<p>1. Zieliński R.J.: Satelitarne sieci teleinformatyczne. Warszawa: Wydawnictwo Naukowo-Techniczne 2016.</p> <p>2. Kabaciński W.: Sieci telekomunikacyjne. Warszawa: Wydawnictwa Komunikacji i Łączności 2015.</p> <p>3. Anil K. Maini, Varsha Agrawai: Satellite technology principles and applications. John Wiley&Sons Ltd. 2011.</p> <p>4. ITU: Handbook on satellite communications. John Wiley & Sons Ltd. 2002.</p>										
	Supplementary literature	<p>1. Bem D.J.: Radiodyfuzja satelitarna. Warszawa: Wydawnictwa Komunikacji i Łączności 1990.</p> <p>2. Wesółowski K.: Systemy Radiokomunikacji Ruchomej. Warszawa: Wydawnictwa Komunikacji i Łączności 2006.</p> <p>3. Maral G.: VSAT Networks. John Wiley&Sons Ltd. 2002.</p>										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	Not applicable											
Work placement	Not applicable											

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