GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00048148		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional 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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Computer Architecture -> 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	0.0	0.0	0.0	15.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

To get the knowledge of methods of verification of digital radio communication system components via computer simulations during design process.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	Student can model and simulate basic components of digital radio communication system.	[SU1] Assessment of task fulfilment
[K6_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them	Student is able to put into practice the knowledge about construction of digital radio communication devices and links.	[SW1] Assessment of factual knowledge

Subject contents

1. Introduction
2. BPSK/QPSK modulator and demodulator
3. GMSK modulator and demodulator
4. 16QAM modulator and demodulator
5. Gaussian channel model
6. Rayleigh fading channel model
7. Rician fading channel model
8. Channel impulse response in urban environment
9. Channel transfer function in urban environment
10. Intersymbol interferences
11. Generation and processing of pseudorandom sequences
12. Modulation filter
13. Design of transmit-receive path in digital radio communication system
14. Analysis of noise characteristics of digital radio communication system
15. Summary of the design works

Prerequisites and co-requisites

Knowledge of Matlab or SciLab

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>project</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Rappaport T.: Wireless communications principles and practice, 2nd edition, Prentice Hall, 2001
Tranter W., Shanmungan K., Rappaport T., Kosbar K.: Principles of communication systems simulation with wireless applications, Prentice Hall, 2003
Miao G.: Signal processing in digital communications, Artech House, 2007</td></tr>
<tr><td>Supplementary literature</td><td>Tse D., Viswanath P.: Fundamentals of Wireless Communication, Cambridge University Press, 2005</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Komputerowe Projektowanie Cyfrowego Systemu Radiokomunikacyjnego 2023/2024 - Moodle ID: 32595
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32595</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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