GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Radio Sensor Networks and Internet of Things, PG_00056861		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Optional 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	1	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Radiocommunication Systems and Networks -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jarosław Sadowski	
	Teachers	dr hab. inż. Jarosław Sadowski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	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	2.0	8.0	25

Subject objectives

To get the principles of operation and method of designing digital radio communication networks based on the examples of wireless sensor networks

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W10] knows and understands, to an increased extent, the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	Student knows the basics of functioning of radio communication systems and is able to relate them to the specifics of designing sensor networks.	[SW3] Assessment of knowledge contained in written work and projects
[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows the structure and principles of operation of typical wireless sensor networks on system and component level.	[SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Characteristics of wireless sensor networks.
2. Structures and topologies of wireless sensor networks.
3. Physical layer of radio links for sensor networks.
4. Data link layer structure for sensor networks.
5. Multiple access methods.
6. Routing in sensor networks.
7. Synchronization of WSN nodes.
8. Architectures and protocols.
9. Resources management and routing in energy-efficient networks.
10. Location-aware sensor networks and positioning services in IoT.
11. Sensor network standards.
12. Cellular IoT standards.
13. Examples of radio modems for WSN.
14. Examples of IoT modems and their applications.
15. Applications of sensor networks.</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>Test at the end of semester</td><td>50.0%</td><td>85.0%</td></tr>
<tr><td>Student's activity</td><td>0.0%</td><td>15.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Zhao, Gibas: Wireless Sensor Networks – An Information Processing Approach, Elsevier 2004
Karl, Willig: Protocols and Architectures for Wireless Sensor Networks, Wiley 2005
Callaway: Wireless Sensor Networks – Architectures and Protocols, Auerbach Publications 2004</td></tr>
<tr><td>Supplementary literature</td><td>Cayirci, Rong: Security In Wireless Ad Hoc and Sensor Networks, Wiley 2009</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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