GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Wearable electronics, PG_00062758		
Field of study	Technologies for Industry 5.0		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Functional Materials Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Piotr Jasiński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

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	30	5.0	40.0	75

Subject objectives

The aim of the course is to familiarize students with intelligent electronic devices that are worn close to and / or on the surface of the skin, where they detect, analyze and transmit information on, i.e.biosignals.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] identifies and solves problems related to signal processing and transmission, integrates measurement and control systems, manages electronic systems in the context of intelligent production processes	The student is able to identify and solve problems related to signal processing and transmission, as well as integrate measurement systems with control systems. He/ she is able to manage electronic systems.	[SU1] Assessment of task fulfilment
[K6_W02] demonstrates knowledge and understanding of electronics, automation and telecommunications and systems theory, that enables identification of problems and formulation of solutions appropriate for the fourth and fifth industrial revolutions	The student demonstrates knowledge and understanding of the fundamentals of electronics, automation and telecommunications, as well as systems theory, which enables them to identify problems and formulate solutions in the context of the challenges of the fourth and fifth industrial revolutions.	[SW1] Assessment of factual knowledge
[K6_K03] effectively, clearly and unambiguously conveys information, describes activities and communicates their results and opinions of a specialist engineer using appropriate communication methods and tools	The student effectively, clearly and unambiguously conveys information, describes activities and communicates results and opinions to the specialist engineer, using appropriate communication methods and tools.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture
Biochemical and chemical wear sensors. Inertial wear sensors. Optical wear sensors. Electronic knitted fabrics and textile fabrics. Flexible electronics: materials, devices and assembly. Power wear electronics and energy management. Collecting energy on the human body: temperature gradient, movement, light, electromagnetic field. Communication technologies in wearable electronics. Antennas. Wearable electronics in sports. Wearable electronics in medical applications.

Prerequisites and co-requisites

<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>Lab</td><td>50.0%</td><td>40.0%</td></tr>
<tr><td>Lecture</td><td>50.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Tao, Xiaoming, ed. Wearable electronics and photonics. Elsevier, 2005.

Kate Hartman, Make: Wearable Electronics: Design, Prototype, and Wear Your Own Interactive Garments, Maker Media, 2014

Subhas C. Mukhopadhyay, Wearable Electronics Sensors: ForSafe and Healthy Livin, Springer, 2015</td></tr>
<tr><td>Supplementary literature</td><td>Journal Frontiers in Elelectronics - Wearable Elelectronics</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">List and describe power supply systems in the wearable electronics</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
</table>

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