GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Experimentarium I, PG_00068287		
Field of study	Biomedical Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Complex Systems Spectroscopy -> Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ireneusz Linert	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	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	2.0	43.0	75

Subject objectives

The aim of the course is to develop habits of scientific methods and explorations together with experimental work in the environment of a physical and biophysical laboratory, as well as to enable students to independently plan and carry out demonstration experiments in the field of biophysics.

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	The student plans and develops an experimental system and its control methodology.	[SU1] Assessment of task fulfilment
[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	the student carries out measurements related to the assigned topic, analyzes and presents the results, critically evaluates the technical solutions used	[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student designs or modifies a measurement system in accordance with the given specification and taking into account safety standards.	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Course content – laboratory
Laboratory exercises and problems: 1. Measurements of the viscosity coefficient and surface tension of liquids 2. Electromyography 3. Thermographic imaging 4. Hering's respiratory model 5. Middle ear model 6. Measurements of hemoglobin absorption spectra 7. Optical systems, microscopy 8. Assessment of visual defects</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Physics 1 and Physics 2, Biophysics</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>tests and reports for laboratory excercises</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>group experimental project</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>University Physics, Openstax</td></tr>
<tr><td>Supplementary literature</td><td>A. Kostrzewska, Biophysics laboratory excercises (2005)</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>What are the stages of the respiration process?

What is the absorption spectrum of a solution and what parameters describe it?</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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