GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basics of Electronics, PG_00067987		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group 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	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Piotr Kurgan	
	Teachers	dr inż. Piotr Kurgan dr inż. Łukasz Gołuński	

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	3.0	42.0	75

Subject objectives	The aim of the course is to introduce basic concepts and elements of electronic systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	Knowledge: The student knows the principles of operation of simple electronic systems and is able to indicate the relationships between elements in the context of basic laws of physics.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_W03] knows and understands, to an advanced 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	Knowledge: The student knows and understands basic electronic components, their properties, and principles of operation in simple and complex systems. Skills: The student is able to design, build, and test a basic electronic circuit using discrete components and basic measurement tools.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U02] can perform tasks related to the field of study in an innovative way as well as solve complex and nontypical problems, applying knowledge of physics, in changing and not fully predictable conditions	Skills: The student is able to design, build and test a basic electronic circuit using discrete components and basic measurement tools. The student is able to independently and collectively solve unusual practical problems related to the construction of circuits, also in conditions of incomplete information. Competencies: The student is able to work in a team, taking on different roles in the implementation of a design task in the field of electronics.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents

Course content – lecture
Lecture:
Introduction to Electronics and DC Circuits (Basic Quantities, Ohm's Law, Connections of Elements, Kirchhoff's Laws, Voltage and Current Sources, Voltage and Current Dividers)
Introduction to Electronics and AC Circuits (AC Generators and Sinusoidal Signals, Reactance and Impedance Capacitors and Inductors, Resonant Circuits, Power in AC Circuits)
Practical Applications of DC and AC Circuits. Analysis Tools.

Laboratory:

Introduction to electronics and working with a breadboard.

Power sources and RC elements

Simulation and optimization of simple electronic circuits (e.g. voltage divider)

Use of the simplest semiconductor devices in simple electronic circuits.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory exercises	50.0%	50.0%
Lecture	50.0%	50.0%

Recommended reading

Basic literature	Paul Horowitz, Winfield Hill The art of electronics. the x chapters, Cambridge University Press, 2015 E. Gates, L. Chartrand, Introduction to Electronics, Delmar Cenagage Learning, 2007

	Supplementary literature	Paul Horowitz, Winfield Hill The art of electronics. the x chapters, Cambridge University Press, 2015 J.D. Irwin, R. M. Nelms, Basic Engineering Circuit Analysis, John Wiley & Sons Inc., 2011
	eResources addresses	
Example issues/ example questions/ tasks being completed	Lecture: Draw and describe the frequency characteristics of a given type of LC filter. Lab: Read the resistor values from the barcode, then measure them using the 4-point method.	
Practical activites within the subject	Not applicable	

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