Subject card

Subject name and code	Introduction to electronics and electrotechnics, PG_00051068
Field of study	Technical Physics

Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
			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	5.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Zakład właściwości magnetycznych i elektrycznych materiałów -> Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej
Name and surname of lecturer (lecturers)	Subject supervisor
	Teachers

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	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	60	5.0	60.0	125

Subject objectives	The aim of the course is to teach students the basics of electronics and electrical engineering, as well as basic skills in the design and testing of simple electronic circuits.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U05] designs and builds a simple measuring device	He or she can design and test an analog circuit fulfilling a specific function in a simulation environment.	[SU5] Assessment of ability to present the results of task
	[K6_U06] makes an initial economic analysis of undertaken engineering activities	He or she can estimate the cost of purchasing the components needed to build the designed electronic circuit.	[SU2] Assessment of ability to analyse information
	[K6_W06] has knowledge of electronics	He or she knows the basic laws governing electronics. He or she distinguishes between the main types of electronic components.	[SW1] Assessment of factual knowledge
	[K6_W07] has knowledge of the construction and operation of physical instruments, measurement and research equipment	He or she knows the structure and principle of operation basic instruments for electronic circuit testing.	[SW1] Assessment of factual knowledge

Subject contents	1. Basics laws of electricity and electronic components 2. Classification of electronic components 3. Schemes of electronic circuits 4. DC electronic circuits 5. AC electronic circuits 6. Basic passive components (RLC) 7. Active components 8. Semiconductors 9. Diodes 10. Transistors 11. Special semiconductor devices 12. Manufacturing of semiconductor devices 13. Integrated circuits 14. Safe exploitation of electrical devices

Prerequisites and co-requisites	No prerequisites		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test of knowledge about instruments used in testing electrical circuits placed on the e-course (15 min.)	51.0%	5.0%
	Report presenting the results of the project	51.0%	15.0%
	Assessment of the implementation of laboratory exercises	51.0%	20.0%
	Cost estimate for the purchase of elements for the construction of the designed electronic circuit	51.0%	5.0%
	Final exam (90 min.)	51.0%	50.0%
	Report on the simulation of an electrical circuit	51.0%	5.0%

Recommended reading	Basic literature	1. A. Chwaleba, B. Moeschke, G. Płoszajski, Elektronika, WSiP, Warszawa, 1999. 2. S. Bolkowski, Elektrotechnika, WSiP, Warszawa, 2006. 3. A. Kloskowski, J. Wawer, Ł. Marcinkowski, Podstawy elektrotechniki i elektroniki, Wyd. Politechniki Gdańskiej, Gdańsk, 2015. 4. W. Opydo, Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, Wyd. Politechniki Poznańskiej, Poznań, 2005. 5. Materials published on e-nauczanie: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10797
	Supplementary literature	1. P. Hempowicz et al., Elektrotechnika i elektronika dla nieelektryków, WN-T, Warszawa, 1999. 2. P. Horowitz, W. Hill, Sztuka elektroniki 1, WKŁ, Warszawa, 2018. 3. M. Polowczyk, A. Jurewicz, Elektronika dla mechaników, Wyd. Politechniki Gdańskiej, Gdańsk 2002. 4. R. Śledziewski, Elektronika dla fizyków, PWN, Warszawa, 1982.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Describe nad illustrate Kirchhoff's first law. 2. Build an RC low pass filter and determine its cut-off frequency. 3. Design, build and perform tests of a rumble metal detector.
Work placement	Not applicable

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