GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Electrical Engineering and Electronics 2, PG_00049766		
Field of study	Power Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
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	English
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Piotr Chrzan	
	Teachers		

Lesson types and methods of instruction

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	4.0	41.0	75

Subject objectives

Introduction and analysis of fundamental electronic components, circuits and applications.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] knows the basics of automation and automatic regulation, knows the principles of the selection of electrical devices, drive systems and their control	Student defines functions and features of electronic circuits in automatic systems. Evaluates technical data of generators, oscilloscopes, multimeters and amplifiers.	[SW1] Assessment of factual knowledge
[K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices	Student specifies properties of passive components. Possesses fundamental knowledge on semiconductor and optoelectronic devices.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K6_K02] is able to work in a group taking different roles in it, can think and act in an entrepreneurial way, is aware of responsibility for their own work and responsibility for teamwork		

Subject contents

Laboratory equipment: multimeters, oscilloscopes, measuring probes. Passive electronic components: resistors, capacitors, inductors. Semiconductors: conduction processes, doped semiconductors, pn junction, ms junction. Diodes: switching, rectifier, Schottky, Zener, photodiodes, light emitting diodes, solar panels. Transistors bipolar and unipolar: structure, operation principles, electrical data and characteristics. Optoelectronic components. Amplifiers: technical data, characteristics, influence of negative feedback. Operational amplifiers. Filters. Power amplifiers. Generators. Power supply units. Phase lock loop. Digital circuit technologies. A/C and D/ C converters.

Prerequisites and co-requisites

Fundamentals of physics and theory of electrical circuits.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test based on lectures	50.0%	50.0%
Laboratory reports	50.0%	50.0%

Recommended reading	Basic literature	Piotr J. Chrzan: Lectures on Electronics, https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6456
	Supplementary literature	Nassir H. Sabah: Electronics basic, analog, and digital with PSpice, CRC Press 2009 by Taylor Francis Group LLC, International Standard Book Number-13: 978-1-4200-8708-6 (eBook - PDF)
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Describe main operation modes of digital oscilloscope and explain features of the passive voltage probe.	
Work placement	Not applicable	