

## 关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

## Subject card

Subject name and code	Analog Electronic Circuits - laboratory, PG_00048068							
Field of study	Electronics and Telecommunications							
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024			
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	3		Language of instruction		Polish			
Semester of study	5		ECTS credits		2.0			
Learning profile	general academic profile		Assessment form		assessment			
Conducting unit	Department of Microelectronic Systems -> Faculty of Electronics, Telecommunications and Informatics							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Jakusz					
	Teachers		dr hab. inż. Waldemar Jendernalik					
			dr hab. inż. Jacek Jakusz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	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	earning activity Participation ir classes includ plan		I didactic Participation in   ed in study consultation hours		Self-study		SUM	
	Number of study hours	30		2.0		18.0		50
Subject objectives	Strengthening the knowledge gained during the lecture and the practical skills of measurement.							

Learning outcomes	Course outcome	Subject outcome	Method of verification	
	[K6_U06] can analyse the operation of components, circuits and systems related to the field of study, measure their parameters and examine technical specifications	The student is able to calculate the parameters of electronic circuits and perform their measurements.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools	
	[K6_W05] Knows and understands, to an advanced extent, methods of supporting processes and functions, specific to the field of study	Strengthening the knowledge of structures and parameters of analog electronic circuits discussed during the lecture.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects	
	[K6_W32] Knows the parameters, functions and methods of analysis, design and optimization of analogue and digital circuits and electronic systems	To practice the ability to analyze and calculate the parameters of analog electronic circuits discussed during the lecture.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects	
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	The student knows the parameters of electronic circuits and is able to carry out their measurements. The student is able to analyze the results of measurements and evaluate the properties of analog electronic circuits.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools	
	[K6_W06] Knows and understands the basic processes occurring in the life cycle of devices, facilities and systems specific to a given field of study.	Strengthening the knowledge of structures and parameters of analog electronic circuits discussed during the lecture.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects	

Subject contents	1. Field Programable Analog Array						
	2. Basic MOS amplifier circuits						
	3. Bipolar operational amplifier						
	4. Negativ feedback						
	5. Broadband bipolar amplifiers						
	6. IC analog filters C-switched						
	7. Cascode - implementation of systemic, properties						
	8. DC differential amplifier						
	9. Pragrammable continuous-time CMOS analog filters						
	10. Selective amplifiers						
	11. Basic structures of oscillators (Wien's and Colpitt's)						
	12. Synchronized generator (PLL)						
	13. Rectifier diode and voltage stabilizer						
	14. DC/DC buck converter						
	15. Transformerless AC/DC converter with power factor corrector						
Prerequisites and co-requisites	Positiv evaluation of the lecture						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Practical exercises	60.0%	100.0%				
Recommended reading	Basic literature	Guzinski A: "Linear electronic analog circuits, WNT, 1994 Tietze U., Schenk Ch.: Semiconductor circuits, WNT 2009					
	Sedra A.S., Smith K.C.: "Microelectronic circuits", Oxi University Press, New York, Oxford, 2004						
	Supplementary literature No recomendations						
	eResources addresses	Adresy na platformie eNauczanie: Analogowe układy elektroniczne - laboratorium 2023/2024 - Moodle ID: 30666 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30666					
Example issues/							
example questions/							
tasks being completed	Not applicable						
work placement	nuor applicable						