



Subject card

Subject name and code		Analog Electronic Circuits - laboratory, PG_00048068						
Field of study		Electronics and Telecommunications						
Date of commencement of studies		October 2023	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		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. Jacek Jakusz				
Lesson types and methods of instruction		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		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	<ol style="list-style-type: none"> 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. Programmable 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 and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercises	60.0%	100.0%
Recommended reading	Basic literature	<p>Guzinski A: "Linear electronic analog circuits, WNT, 1994</p> <p>Tietze U., Schenk Ch.: Semiconductor circuits, WNT 2009</p> <p>Sedra A.S., Smith K.C.: "Microelectronic circuits", Oxford University Press, New York, Oxford, 2004</p>	
	Supplementary literature	No recomendations	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		