GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electronic circuits, PG_00051073		
Field of study	Technical Physics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional subject group 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	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Solid State Physics -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ryszard Barczyński	
	Teachers	dr hab. inż. Ryszard Barczyński dr inż. Bartosz Trawiński	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	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 familiarize students with basic electronic circuits.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U04	The student effectively uses the basic instruments and laboratory equipment.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task
K6_W07	The student builds basic laboratory systems and analyzes their operation.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K6_U05	The student designs, builds and runs a simple electronic device.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
K6_W06	The student analyzes and designs basic electronic circuits.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K6_W12	The student works safely in the laboratory.	[SW1] Assessment of factual knowledge

Subject contents

* Amplifier as a four terminal network, feedback, amplifier stability. * Amplifiers built on the basis of the operational amplifiers, summing, integating, differentiating and transimpedance amplifiers. * Selective amplifiers, active RC filters. * Nonlinear functional blocks. * Wideband and power amplifiers. * RC, LC and crystal generators. * Pulse and flip-flop circuits. * Power management citcuits, linear and switching voltage controllers. * Combinative and sequential logical circuits.

Prerequisites and co-requisites

No requirements

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory experiments	51.0%	33.0%
	Colloquium	51.0%	34.0%
	Tutorials	51.0%	33.0%
Recommended reading	Basic literature	* Materiały z wykładów umieszczone na stronie WWW http://www.mif.pg.gda.pl/homepages/jasiu/stud/WEiE * Michał Polowczyk, Elektronika dla fizyków, PWN Warszawa * P. Horowitz, W. Hill, Sztuka elektroniki, WKŁ 2003 * U. Tietze, Ch. Schenk, Układy półprzewodnikowe	
	Supplementary literature	* Ben G. Streetman, Przyrządy półprzewodnikowe * Ch.L. Alley, K.W. Atwood, Elementy i układy półprzewodnikowe * Behzad Razavi, Fundamentals of microelectronics, Wiley 2008. * Mirosław Rusek, Jerzy Pasierbiński, Elementy i układy elektroniczne w pytaniach i odpowiedziach, NT Warszawa 2006.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	For which purpose can not be achieved using negative-feedback amplifier circuit? A) Reduction of the sensitivity of the scattering parameters of the amplifier components. B) Reduction of non-linear distortion. C) Increase the gain. D) Expanding the bandwidth of the amplifier. To obtain the output signal of a differential amplifier with a voltage of 1V can be applied between the input signal of 1 mV. When you change the power supply voltage of 1V, the output voltage of 10mV change. Amplification factor of the amplifier is so ... A) 120dB. B) 40dB. C) 60dB. D) 90dB.		
Work placement	Not applicable		