



Subject card

Subject name and code	Electronics, PG_00040183						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Obligatory subject group 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	4		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 inż. Piotr Kurgan				
	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		6.0		14.0	50
Subject objectives	The objective of the course is to introduce a student to the basics of electronics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W10		Student possesses an elementary knowledge on electronics, including basic laws of circuit and signal theory, knows laws of electromagnetism, and knows operation mechanisms and properties of basic semiconductor devices.		[SW1] Assessment of factual knowledge		
	K6_U05		Student is able to conduct basic measurements of electrical quantities. Is able to perform computer-aided simulations of analog electronic circuits. Is capable of experimental verification of the operation of analog electronic circuits.		[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	<p>1. The phenomenon of the current in electrical circuits. Conductors, isolators, semiconductors and superconductors. Electric current and voltage (potential difference). Ohm's law and Kirchhoff's laws.</p> <p>2. Resistors, voltage and current sources. Powers associated with resistors and sources. Thevenin and Norton equivalent circuits.</p> <p>3. Current, voltage and power waveforms in time and frequency domains. Spectrum of time waveforms.</p> <p>4. LC filters.</p> <p>5. Magnetism.</p> <p>6. DC and AC applications.</p> <p>7. Basics of semiconductor devices.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory - reports from the laboratory tasks	50.0%	50.0%
	Lecture - test in the end of the semester	50.0%	25.0%
	Lecture - test in the middle of the semester	50.0%	25.0%
Recommended reading	Basic literature		<p>[1] J.D. Irwin, R. M. Nelms, Basic Engineering Circuit Analysis, John Wiley & Sons Inc., 2011</p> <p>[2] E. Gates, L. Chartrand, Introduction to Electronics, Delmar Cengage Learning, 2007</p>
	Supplementary literature		<p>[1] A. Agawal, J.H. Lang, Foundations of Analog and Digital Electronic Circuits, Elsevier, 2005</p> <p>[2] U. Tietze, C. Schenk, E. Gamm, Electronic Circuits Handbook for Design and Applications, Springer, 2008</p> <p>[3] A.S. Sedra, K.C. Smith, Microelectronic Circuits, Oxford University Press, 2007</p>
	eResources addresses		Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	<p>1. Calculate Thevenin and Norton equivalent circuits for a given example.</p> <p>2. Draw and describe frequency characteristic of an LC filter of a given type.</p> <p>3. Describe the construction and operation principle of an AC generator.</p> <p>4. Name and describe Maxwell's equations.</p>		
Work placement	Not applicable		