

### COURSE DESCRIPTION CARD

Faculty of Electrical Engineering										
<b>Field of study</b>	<b>Electrical and Electronics Engineering</b>							<b>Degree level and programme type</b>	<b>bachelor's degree</b>	
<b>Specialization/ diploma path</b>	-							<b>Study profile</b>	-	
<b>Course name</b>	<b>Electronics 1</b>							<b>Course code</b>	<b>IS-FEE-10006W</b>	
								<b>Course type</b>	<b>elective</b>	
<b>Forms and number of hours of tuition</b>	<b>L</b>	<b>C</b>	<b>LC</b>	<b>P</b>	<b>SW</b>	<b>FW</b>	<b>S</b>	<b>Semester</b>	<b>winter</b>	
	15	15	30					<b>No. of ECTS credits</b>	<b>6</b>	
<b>Entry requirements</b>	Electrical Circuits 1									
<b>Course objectives</b>	To provide students with basic knowledge of electronic devices. To develop skills in analysis, design and testing of electronic circuits containing diodes, transistors and operational amplifiers.									
<b>Course content</b>	Diodes – parameters, I-V characteristics, DC and AC models. Simple circuits containing diodes. Transistors (BJT, FET and MOSFET) – principles of operation, I-V characteristics, equivalent circuits. Transistor biasing. Single stage transistor amplifiers. Small signal analysis of amplifiers. Transistor as a switch. Parameters of operational amplifiers. Ideal OpAmp. Basic applications of operational amplifiers. Analysis and design of electronic devices and circuits using PSPICE.									
<b>Teaching methods</b>	lecture, class, laboratory class, computer simulations									
<b>Assessment method</b>	lecture: written exam; class: two tests, laboratory class: evaluation of reports, verification of preparation for classes									
<b>Symbol of learning outcome</b>	<b>Learning outcomes</b>								<b>Reference to the learning outcomes for the field of study</b>	
<b>LO1</b>	describes the basic operation, characteristics and applications of diodes, transistors and operational amplifiers									
<b>LO2</b>	can apply knowledge of mathematics and engineering to analyze and design circuits containing diodes, transistors and operational amplifiers									
<b>LO3</b>	analyzes an electronic circuit using PSpice									
<b>LO4</b>	uses laboratory instruments for the measurement of circuit parameters and the data acquisition									
<b>LO5</b>	analyzes and interprets measurement data and prepares reports									
<b>LO6</b>	uses datasheets and application notes									

Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
LO1	written exam, tests	L, LC	
LO2	written exam, tests	L, C, LC	
LO3	verification of preparation for classes	LC	
LO4	tests, evaluation of class work	LC	
LO5	evaluation of reports	LC	
LO6	evaluation of class work	LC	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15	
	participation in classes	15	
	preparation for classes	15	
	participation in laboratory classes	30	
	preparation for laboratory classes	20	
	working on projects, reports	25	
	participation in student-teacher sessions related to the classes/laboratory classes	5	
	preparation for and participation in exams/tests	25	
<b>TOTAL:</b>		150	
Quantitative indicators		HOURS	No. of ECTS credits
<b>Student workload – activities that require direct teacher participation</b>		65	2,6
<b>Student workload – practical activities</b>		110	4,4
<b>Basic references</b>	<ol style="list-style-type: none"> <li>Sedra A.S., Smith K. C.: Microelectronic Circuits. Oxford University Press, 2004.</li> <li>Muret P.: Fundamentals of Electronics 1 : Electronic Components and Elementary Functions, John Wiley &amp; Sons, Inc., 2017 (Available from: ProQuest Ebook Central)</li> </ol>		
<b>Supplementary references</b>	<ol style="list-style-type: none"> <li>Boysen E., Kybett H.: Complete Electronics Self-Teaching Guide with Projects, John Wiley &amp; Sons, Inc., 2012 (Available from: ProQuest Ebook Central)</li> <li>Singh S.: Electronics Engineering, Alpha Science International, New Delhi, 2014 (Available from: ProQuest Ebook Central)</li> <li>Westcott S., Westcott J.R.: Basic Electronics: Theory and Practice, Mercury Learning &amp; Information, 2015 (Available from: ProQuest Ebook Central)</li> <li>Saggio G.: Principles of analog electronic. CRC Press, 2014.</li> </ol>		
<b>Organisational unit conducting the course</b>	Department of Automatic Control and Robotics	<b>Date of issuing the programme</b>	
<b>Author of the programme</b>	Andrzej Karpiuk, Ph.D.	23.02.2021	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar