

COURSE DESCRIPTION CARD

Faculty of Electrical Engineering									
Field of study	Electrical and Electronics Engineering							Degree level and programme type	bachelor's degree
Specialization/ diploma path	-							Study profile	-
Course name	Electronics 1							Course code	IS-FEE-10006S
								Course type	elective
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	15	15	30					No. of ECTS credits	6
Entry requirements	Electrical Circuits 1								
Course objectives	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.								
Course content	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.								
Teaching methods	lecture, class, laboratory class, computer simulations								
Assessment method	lecture: written exam; class: two tests; laboratory class: evaluation of reports, verification of preparation for classes								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	describes the basic operation, characteristics and applications of diodes, transistors and operational amplifiers								
LO2	can apply knowledge of mathematics and engineering to analyze and design circuits containing diodes, transistors and operational amplifiers								
LO3	analyzes an electronic circuit using PSpice								
LO4	uses laboratory instruments for the measurement of circuit parameters and the data acquisition								
LO5	analyzes and interprets measurement data and prepares reports								
LO6	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	
TOTAL:		150	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		65	2,6
Student workload – practical activities		110	4,4
Basic references	<ol style="list-style-type: none"> Sedra A.S., Smith K. C.: Microelectronic Circuits. Oxford University Press, 2004. Muret P.: Fundamentals of Electronics 1 : Electronic Components and Elementary Functions, John Wiley & Sons, Inc., 2017 (Available from: ProQuest Ebook Central) 		
Supplementary references	<ol style="list-style-type: none"> Boysen E., Kybett H.: Complete Electronics Self-Teaching Guide with Projects, John Wiley & Sons, Inc., 2012 (Available from: ProQuest Ebook Central) Singh S.: Electronics Engineering, Alpha Science International, New Delhi, 2014 (Available from: ProQuest Ebook Central) Westcott S., Westcott J.R.: Basic Electronics: Theory and Practice, Mercury Learning & Information, 2015 (Available from: ProQuest Ebook Central) Saggio G.: Principles of analog electronic. CRC Press, 2014. 		
Organisational unit conducting the course	Department of Automatic Control and Robotics	Date of issuing the programme	
Author of the programme	Andrzej Karpiuk, Ph.D.	23.02.2021	

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

S – seminar