

Bialystok University of Technology									
Field of study	Computer Science							Degree level and programme type	Engineer's degree full-time programme
Specialization/ diploma path	---							Study profile	academic
Course name	Foundations of Electrotechnics and Electronics							Course code	FCS-00053
								Course type	obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	2
	30	30	15					No. of ECTS credits	6
Entry requirements	Linear Algebra (FCS-00030), Calculus (FCS-00002),								
Course objectives	The main goal/purpose of this course is to study the basics of Electric and Electronics circuits and systems in addition to the idea of circuit parameters measuring and computation (like voltage, current, power and energy).								
Course content	Electric Circuit Principles (voltage, current, power and energy); Kirchhoff's Laws; Superposition Theorem; Thevenin's Theorem; Maximum Power Transfer Theorem; Periodic Waveforms and Signals; Elements of a.c. Circuits; Complex Representation of Electrical Quantities; RLC Circuits - Phasor Representation; Series and Parallel Resonance Circuits; Resonance filters; Basic ideas of transient d.c. current (capacitor charging and discharging and switching principles). Diodes and their characteristics, half and full-wave rectification with filters; Zener diode; Transistor - configuration and biasing; AND, OR and NOT logic circuits with discrete elements.								
Teaching methods	lecture problem, subject exercises, laboratory exercises,								
Assessment method	Lecture: written and/or oral exam. Tutorial: 2 mid-term written exams Laboratory: Lab. Report after each experiment								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	knows the basic concepts of Electrical and electronic circuits							K_W02	
LO2	knows how to solve problems in simple circuit analysis							K_W02 K_U02	
LO3	knows how to measure and compute electric energy and power							K_U03	
LO4	knows how to document the results of experiments and measurements							K_U14	
LO5	is able to work in a group assuming different roles in it							K_U06	
Symbol of learning outcome	Methods of assessing the learning outcomes							Type of tuition during which the outcome is assessed	
LO1	written exam							L	
LO2	written exam, homework, work during classes							L,C,Lc	
LO3	work during classes							Lc	
LO4	work during classes, report on the exercise grade							Lc	
LO5	work during classes, report on the exercise grade							Lc	
Student workload (in hours)							No. of hours		
Calculation	1 - Attendance at lectures - 15 x 2							30	
	2 - Attendance at laboratories - 15 x (1+1)							30	
	3 - Preparation for laboratories -							30	
	4 - Performance of projects tasks -							35	
	5 - Participation in student-teacher sessions -							5	
	6 - Preparation for the exam -							10	
	7 - Preparation for laboratories tests -							10	
TOTAL:							150		
Quantitative indicators							HOURS	No. of ECTS credits	
Student workload - activities that require direct teacher participation							65 (1)+(5)+(2)	2.6	
Student workload - practical activities							105 (2)+(4)+(3)+(7)	4.2	
Basic references	1. Bobrow L., Elementary Linear Circuit Analysis, Holt-Saunders International, Tokyo 1980. 2. Cooper W. D., Electronic Instrumentation and Measurement Techniques, Prentice-Hall, New Jersey 1978. 3. Rodney Edwards, Douglas Meyer, Electronics: A Basic Course, McGraw-Hill, Sydney 1991.								
Supplementary references	1. Saeed K., Electric Circuits and Systems with solved problems. Advanced Knowledge International, Adelaide, Australia 2005. 2. O'Malley J. R., Circuit Analysis, Prentice-Hall, New Jersey 1980. 3. Jacob Millman, Arvin Gabel, Microelectronics, McGraw-Hill, New Jersey 1987.								
Organisational unit conducting the course	Department of Digital Media and Computer Graphics							Date of issuing the programme	
Author of the programme	dr inż. Wiktor Jakowluk, prof. dr hab. inż. Khalid Saeed							Feb. 18, 2022	

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