

COURSE DESCRIPTION CARD

Faculty of Electrical Engineering									
Field of study	Electrical and Electronics Engineering							Degree level and programme type	bachelor's degree, full time programme
Specialization/ diploma path	-							Study profile	-
Course name	Power Electronics							Course code	IS-FEE-10013W
								Course type	elective
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	30							No. of ECTS credits	3
Entry requirements	-								
Course objectives	The acquaint with basic power electronics devices and different types of converters (DC/DC, AC/DC, DC/AC, AC/AC 1- and 3-phases) and its control. The acquire of skills to different types converter operation analyze.								
Course content	Power semiconductor devices (SCR, BJT, MOSFET, IGBT). Single and three phases controlled rectifiers with different type of load. The rectifier influence on the net, active, reactive and distortion powers. The DC/AC and AC/DC converters - structures and control. The transistors matrix converter controlled by PWM methods. 2- and 4-quadrant DC-DC converters. Vectorial model of 3-phases converter								
Teaching methods	lecture, specialization workshop.								
Assessment method	lecture: written exam; specialization workshop: evaluation of reports.								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
L01	lists, clasiffies and discusses operation of basic power electronic converters								
L02	discusses properties of the power electronic devices								
L03	describes present state and developmental trends of the power electronics								
L04	analyses and evaluates operation of selected types converter on the base of test results								
Symbol of learning outcome	Methods of assessing the learning outcomes							Type of tuition during which the outcome is assessed	
L01	written and oral exam							L	

LO2	written and oral exam	L	
LO3	written and oral exam	L	
LO4	written and oral exam	L	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30	
	participation in student-teacher sessions related to the lecture	10	
	preparation for and participation in exams	35	
		TOTAL:	75
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		42	1,5
Student workload – practical activities		0	0
Basic references	<ol style="list-style-type: none"> 1. Rashid H. M.: Power electronics handbook : devices, circuits, and applications. Academic Press, 2007. 2. Mazda F.: Power electronics handbook. Elsevier, 2003. 3. Erickson R. W., Maksimowic D.: Fundamentals of power electronics. Kulwer Academic, 2001. 4. Rarnes M.: Practical variable speed drives and power electronics. Elsevier, 2003. 		
Supplementary references	<ol style="list-style-type: none"> 1. Bin Wo: Power conversion and control of wind energy system. J. Wiley & Sons, 2011. 2. Benysek G.: Improvement in the quality of delivery of electrical energy using power electronics systems. Springer, 2007. 3. Wilamowski B. M., Irwin J. D.: Power electronics and motor drives – the industrial electronics handbook. Taylor and Francis, 2005. 4. Strzelecki R., Benysek G.: Power electronics in smart electrical energy networks. Springer, 2008 		
Organisational unit conducting the course	Department of Electrotechnics, Power Electronics and Power Engineering	Date of issuing the programme	
Author of the programme	Agata Godlewska	20.01.2020	

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