			F	aculty	of Ele	ctrical	Engin	eering	
Field of study	Electrical and Electronics Engineering							Degree level and programme type	bachelor's degree, full time programme
Specialization/ diploma path	- Study profile						Study profile	-	
Course name	Workshop on Programmable Logic Device							Course code	IS-FEE-10038S
								Course type	elective
Forms and number of hours	L	С	LC	Р	SW	FW	S	Semester	summer
of tuition					30			No. of ECTS credits	4
Entry requirements							-		
Course objectives	Use of programmable logic device in real life example. Preparation of technical documentation, tools description and programming methods. Use of hardware description language to synthesise logic device controlling assigned plant. Oral presentation with discussion on individual project.								
Course content	Programmable logic device (PLD) especially field programmed gate array (FPGA) characterisation. Introduction to selected computer-aided design (CAD) tool and hardware description language (HDL). Programming and testing of logic devices based on standard and self-prepared libraries. Automatic control of selected peripheral device. Synthesis of real life example of logic devise based on FPGA modul.								
Teaching methods	project/specialization workshop.								
Assessment	projects completion, presentation and discussion of the projects.								
method		p	orojects	s comp		· •		·	f the projects.
Symbol of		p	orojects	-	oletion	, prese	entation	·	Reference to the
Symbol of learning outcome		Aft	ter com	Lea pleting	oletion arning this su	, prese outcor	entation nes tudent	n and discussion of	Reference to the
Symbol of learning outcome LO1		Aft	ter com	Lea pleting erize p	oletion arning this su	, prese outcor <i>ibject s</i>	entation nes tudent	n and discussion of is able to: devices;	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2		Aft cl gather i	ter com naracte	Lea pleting erize pl ation f	arning this su rogram	, prese outcor ubject s nmable chnica	entation nes tudent logic	n and discussion of is able to: devices; mentation;	Reference to the learning outcomes for
Symbol of learning outcome LO1		Aft cl gather i	ter com naracte inform	Lea pleting erize p ation f his ow	arning this su rogram rom te vn tech	, prese outcor ubject s nmable chnica nical c	entation nes tudent logic locume	a and discussion of is able to: devices; mentation; entation;	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2		Aft cl gather i	ter com naracte inform	Lea pleting erize p ation f his ow	arning this su rogram rom te yn tech	, prese outcor ibject s mable chnica nical c utions	entation nes tudent logic locume	n and discussion of is able to: devices; mentation;	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2 LO3		Aft cl gather i	ter com naracte informa repare s probl	Lea pleting erize pl ation f his ow ems a	arning this su rogram rom te rn tech nd solu	, prese outcor ubject s nmable chnica nical c utions ect;	entation nes tudent logic l docu locume conce	a and discussion of is able to: devices; mentation; entation; ming assigned	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2 LO3 LO4		Afr cl gather i pr resents	ter com naracte informa repare s probl use i	Lea pleting erize pr ation f his ow ems a	arning this su rogram rom te yn tech nd solu proj sary pr	, prese outcor ibject s mable chnica nical c utions ject; ogram	entation nes tudent logic locume concer ming te	a and discussion of is able to: devices; mentation; entation; ming assigned	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2 LO3 LO4 LO5	p	Afi cl gather i pr resents	ter com naracte informa repare s probl use i e selec	Lea pleting erize pl ation f his ow ems a necess ted ha	arning this su rogram rom te not solu proj sary pr rdware	, prese outcor <i>ibject s</i> nmable chnica nical c utions ject; ogram	entation nes tudent logic locume concer ming to iption	and discussion of is able to: devices; mentation; entation; ming assigned	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2 LO3 LO4 LO5 LO6	p	Afi cl gather i pr resents	ter com naracte informa repare s probl use i s selec ime an	Lea pleting erize pr ation f his ow ems a ems a necess ted ha d fund	oletion arning this su rogram rom te nd solu proj sary pr rdware s nece	, prese outcor ubject s nmable chnica nical c utions ect; ogram descr ssary	entation nes tudent logic locume concer ming to iption	and discussion of is able to: devices; mentation; entation; rning assigned pols; language; ject realization;	Reference to the learning outcomes for
Symbol of learning outcome LO1 LO2 LO3 LO4 LO5 LO6 LO7	p	Afri cl gather i pr resents use entify t	ter com naracte informa repare s probl use i s selec ime an work v	Lea pleting erize pr ation f his ow ems a ems a necess ted han d fund well in	oletion arning this su rogram rom te yn tech nd solu proj sary pr rdware s nece dividua	, prese outcor ubject s nmable chnica nical c utions ect; ogram descr ssary ally an	entation nes tudent logic locume concer ming to iption for pro d in a g	and discussion of is able to: devices; mentation; entation; rning assigned pols; language; ject realization;	Reference to the learning outcomes for the field of study
Symbol of learning outcome LO1 LO2 LO3 LO4 LO5 LO6 LO7 LO8 Symbol of learning	p	Affi cl gather i pi resents use entify t	ter com naracte informa repare s probl use i s selec ime an work v	Lea pleting erize pr ation f his ow ems a necess ted han d fund well in	oletion arning this su rogram rom te rom tech nd solu proj sary pr rdware s nece dividus	, prese outcor ibject s imable chnica nical c utions ect; ogram descr ssary ally an the lea	entation nes tudent logic locume concel ming to iption for pro d in a g	and discussion of is able to: devices; mentation; entation; ming assigned cols; language; ject realization; group.	Reference to the learning outcomes for the field of study

COURSE DESCRIPTION CARD

LO3	initial project documentation;				
LO4	oral presentation;				
LO5	project documentation;				
LO6	project documentation;				
L07	project documentation;				
LO8	discussion of the student's projects, evaluation of the				
LOU	student's performance in classes				
	Student workload (in hours)	No. of	hours		
	participation in classes	30			
	preparation for classes	15			
	work on projects	60			
	participation in student-teacher sessions related to the class	1			
Calculation	preparation for and participation in project presentations	6			
	TOTAL:	112			
	Quantitative indicators	HOURS	No. of ECTS credits		
Student wor	kload – activities that require direct teacher participation	30 1			
	Student workload – practical activities				
Basic references	 Deschamps J. P.: Synthesis of arithmetic circuits FPGA, ASI systems. J. Wiley, 2006. Chu P. P.: FPGA prototyping by VHDL examples: Xiling Spar 2008. http://www.altera.com/literature/lit-index.html 				
Supplementary references	1. http://www.fpga4fun.com/				
Organisational unit conducting the course	Department of Automatic Control and Robotics	Date of issuing the programme			
Author of the programme	Łukasz Sajewski, Ph.D. Eng.	08.02.2020			
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar