

## 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	Radioelectronic Devices							Course code	IS-FEE-10017W	
								Course type	elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	30		30					No. of ECTS credits	6	
Entry requirements	-									
Course objectives	The principal objective of lectures is to cover the fundamentals of main radioelectronics circuits (amplifiers, oscillators, frequency multipliers, mixers) and analogue modulation (AM,FM,PM modulations, modulators and demodulators structures). The basis of superheterodyne receivers are presented.									
Course content	Static and dynamic characteristics. Approximation characteristics of active elements. Classes and regimes of work. Analysis of work of resonance power amplifier. Frequency multipliers. LC and crystal oscillators. Amplitude modulation. AM modulators and demodulators. Angle modulations - FM and PM. FM modulators and demodulators. Frequency mixers. Superheterodyne receiver idea.									
Teaching methods	lecture, laboratory class									
Assessment method	lecture: oral exam, two small tests during lecture, evaluation of homeworks; 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	has a knowledge of work principles of basis radioelectronic devices;									
LO2	has a knowledge of principles of modulation and demodulations;									
LO3	has a skill of frequency spectrum measurements;									
LO4	has a skill of measurements of radioelectronic devices characteristics.									
LO5										
LO6										
LO7										

LO8		
<b>Symbol of learning outcome</b>	<b>Methods of assessing the learning outcomes</b>	<b>Type of tuition during which the outcome is assessed</b>
LO1	evaluating the student's reports and preparation for the classes	L
LO2	evaluating the student's reports and preparation for the classes , tests on lecture content	L,LC
LO3	evaluating the student's reports, tests on lecture content	L,LC
LO4	evaluating the student's reports, tests on lecture content	L,LC
LO5		
LO6		
LO7		
LO8		
<b>Student workload (in hours)</b>		<b>No. of hours</b>
<b>Calculation</b>	lecture attendance	30
	participation in laboratory classes	30
	participation in laboratory classes	15
	preparation for laboratory reports	30
	preparation reports from homeworks	30
	preparation for and participation in exams/tests	20
	<b>TOTAL:</b>	<b>155</b>
<b>Quantitative indicators</b>		<b>HOURS</b>
		<b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		<b>60</b>
<b>Student workload – practical activities</b>		<b>75</b>
<b>Basic references</b>	1. Li R., Chi-Hsi: RF circuit design. Wiley, 2008. 2. Grebennikov A.: RF and microwave power amplifier design. McGraw-Hill, 2005. 3. Hagen J. B.: Radio-frequency electronics. Circuits and applications. Cambridge University, 2009.	
<b>Supplementary references</b>	1. Sorrentino R., Bianchi G.: Microwave and RF engineering. Wiley, 2010. 2. Whitaker J.C.: The RF transmission systems handbook. CRC Press, 2002.	
<b>Organisational unit conducting the course</b>	<b>Department of Photonics, Electronics and Light Technique</b>	<b>Date of issuing the programme</b>
<b>Author of the programme</b>	<b>Maciej Sadowski, Ph. D. Eng.</b>	<b>13.02.2020</b>

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

S – seminar