

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	Wireless Transmission Systems							Course code	IS-FEE-10019W	
								Course type	elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	30							No. of ECTS credits	2	
Entry requirements	-									
Course objectives	To acquaint students with the techniques used to transmit information in wireless systems. To acquaint students with the architecture, principles of operation and application of modern wireless systems.									
Course content	Decibel calculation in radiocommunication. Ranges and properties of radio waves used in wireless communication. Basics of radio wave propagation. Radio wave propagation in free space. The structure and characteristics of the radio link. Radiocommunication equation. Bases of antenna array operation. Mathematical description of multiport radio devices. Impedance, admittance and dissipation matrices in the description of the properties of wireless devices. The matching of radio devices. Rayleigh ratio. Basics of operation of various types of commonly used wireless systems - architecture, principle of operation, radio channels, application. Satellite systems, trunking systems, cellular systems.									
Teaching methods	lecture									
Assessment method	exam and evaluation of reports									
Symbol of learning outcome	Learning outcomes								Reference to the learning outcomes for the field of study	
LO1	has knowledge about radio wave propagation									
LO2	has knowledge about techniques used for transmission information in wireless systems									
LO3	has knowledge about structure, operation, mathematical description of multiport radio devices									
LO4	has knowledge about operation of antenna arrays									

L05	has knowledge about operation of commonly used wireless systems	
L06		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
L01	exam on lecture content	L
L02	exam on lecture content	L
L03	exam on lecture content	L
L04	exam on lecture content	L
L05	evaluation of reports and presentation of selected topic	L
L06		
Student workload (in hours)		No. of hours
Calculation	lecture attendance	30
	preparation reports from homeworks	15
	preparation for and participation in exams/tests	15
	TOTAL:	60
Quantitative indicators		HOURS
Student workload – activities that require direct teacher participation		30
Student workload – practical activities		15
Basic references	Siwiak K.: Radiowave propagation and antennas for personal communications. Artech House, 2007. Saunders S.: Antennas and propagation for wireless communications systems. Wiley & Sons, 2007. Rohde U.: RF/microwave circuit design for wireless applications. Wiley & Sons, 2013.	
Supplementary references	Fujimoto K., James J. R.: Mobile antenna system handbook. Artech House, 1994. Sorrentino R., Bianchi G.: Microwave and RF engineering. Wiley & Sons, 2010. Randy L.: Antenna arrays : a computational approach. Wiley & Sons, 2010. Rhee M.Y., Mobile communication systems and security. Wiley & Sons, 2009. Maral G., M. Bousquet M., Satellite communications systems. Wiley & Sons, 2002.	
Organisational unit conducting the course	Department of Photonics, Electronics and Lighting Technology	Date of issuing the programme
Author of the programme	Marek Garbaruk, Ph.D. Eng.	20.02.2021

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

S – seminar