COURSE DESCRIPTION CARD

Faculty of Electrical Engineering									
Field of study	**Electrical and Electronics Engineering**							**Degree level and programme type**	**Bachelor's degree**
Specialization/ diploma path	-							**Study profile**	-
Course name	**Automatics in Telecommunication**							**Course code**	**IS-FEE-10050W**
								Course type	**elective**
Forms and number of hours of tuition	**L**	**C**	**LC**	**P**	**SW**	**FW**	**S**	**Semester**	**winter**
	15				15			**No. of ECTS credits**	**3**
Entry requirements	**Circuits and Signals, Basics of Telecommunication**								
Course objectives	To familiarize students with the basic principles of system operation control, tracking and synchronization in telecommunications systems and methods of their implementation								
Course content	The mathematical methods of the description of the automation systems. The structure of the systems, transfer function, the conditions of stability and accuracy. Correlational analysis of automation systems in the presence of the noise . Discrete systems. Non-linear systems. Kalman Filters. Synchronization in digital telecommunications systems, phase locked Loop the Costas, loop. Synchronization in telecommunication networks.								
Teaching methods	lecture - interactive lecture, specialization workshop - simulation of the systems								
Assessment method	**lecture – written exam; specialization workshop – 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	Student describes the linear and non-linear control systems used in telecommunications and analyzes their operation								
LO2	Student describes the operation of sychronization systems in telecommunication networks								
LO3	Student schedules and simulates the operation of simple Automation devices in the presence of disturbances, analyzes the results and make conclusions								
LO4	Student prepares the raport on the performed simulations								
LO5									
Symbol of learning outcome	**Methods of assessing the learning outcomes**								**Type of tuition during which the outcome is assessed**
LO1	written test								**L**

LO2	assesment during laboratory classes	L
LO3	written test, assesment during laboratory classes	**SW**
LO4	evaluation of the reports	**SW**
LO5		

Student workload (in hours)		**No. of hours**
Calculation	**lecture attendance**	**15**
	participation in specialization workshop	**15**
	preparation for specialization workshop	**10**
	working on reports	**10**
	participation in student-teacher sessions related to the classes	**4**
	participation in student-teacher sessions related to specialization workshop	**6**
	preparation for and participation in exam	**20**
	TOTAL:	**80**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	**40**	**1,5**
Student workload – practical activities	**41**	**1,5**

Basic references	1. S Haykin - Digital Communication Systems. John Wiley & Sons, Inc. 2014 2. S Haykin - Communication Systems, 4th Ed. John Wiley & Sons, Inc. - 2001 3. Proakis J.G., Salehi M.: Communication systems engineering. Prentice-Hall, Inc., 2002.
Supplementary references	1. S. Haykin - Adaptive Filter Theory 3rd Ed., Prentice Hall, 2009 2. F. Gustafson – Adaptive Filtering and Change Detection. Wiley & Sons , 2000 . 3. S. Sarkaa – Bayesian Filtering and Smoothing. Cambridge University Press, 2013.

Organisational unit conducting the course	**Department of Photonics, Electronics and Light Technique**	**Date of issuing the programme**
Author of the programme	**Adam Nikolajew, Ph. D.**	**15.01.2020**

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