

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 | Coding and transmission of signals | | | | | | | Course code | IS-FEE-10049W |
| | | | | | | | | 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 methods of the source and channel encoding of signals, principles of passband and baseband digital transmission, types of modulation and the influence of the parameters of the signal and disturbances on the quality of the transmission. Practical verification of the knowledge. | | | | | | | | |
| Course content | Mathematical description of the noise in the transmission medium. The basic concepts of the theory of detection and evaluation of the telecommunications signals. Characteristics of the baseband signals and encoding methods. Digital modulation methods: BPSK, QPSK, AM/PSK, MSK. Multiple methods of access: SDMA, TDMA, CDMA. Principles of channel coding: the concept of code distance block, cyclic and convolution codes.. | | | | | | | | |
| Teaching methods | Lecture, presentation, projects, practical work in laboratory | | | | | | | | |
| Assessment method | lecture – written exam; laboratory classes – evaluation of reports, verification of preparation for classes | | | | | | | | |
| Symbol of learning outcome | Learning outcomes | | | | | | | Reference to the learning outcomes for the field of study | |
| L01 | Student describes methods of modulation, coding and transmission of the signals in presence of the disturbances | | | | | | | | |
| L02 | Student performs measurements of telecommunication signals parameters | | | | | | | | |
| L03 | Student analyzes the effect of the coding and the modulation of the signal on the quality of the transmission | | | | | | | | |
| L04 | Student prepares the raport on the performed measurements | | | | | | | | |
| L05 | | | | | | | | | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | | | | | | | Type of tuition during which the outcome is assessed | |

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| L01 | written test | L, LC | |
| L02 | assesment during laboratory classes | LC | |
| L03 | written test, assesment during laboratory classes | L, LC | |
| L04 | evaluation of the reports | LC | |
| L05 | | | |
| Student workload (in hours) | | No. of hours | |
| Calculation | lecture attendance | 15 | |
| | participation in laboratory classes | 15 | |
| | preparation for laboratory classes | 10 | |
| | working on reports | 10 | |
| | participation in student-teacher sessions related to the classes | 4 | |
| | participation in student-teacher sessions related to the laboratory classes | 6 | |
| | preparation for and participation in exam | 20 | |
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| | TOTAL: | 80 | |
| Quantitative indicators | | HOURS | No. of ECTS credits |
| Student workload – activities that require direct teacher participation | | 40 | 1,5 |
| Student workload – practical activities | | 45 | 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. J. L. Brubank, J. Andrusenko, J. S. Everett, W. T. M. Katsch – Wireless Networking. Understanding Internetworking Challenges. IEEE Press 2013. 2. C.Cox – An Introduction to LTE. LTE, LTE Advanced, SAE, VoLTE, and 4G Mobile Communications. 2nd Ed. Wiley, 2014. 3. S. Ahmadi – LTE Advanced. A Practical Systems Approach to Understandingthe 3GPP LTE Releases 10 And 11 Radio Access Technologies. Elsevier 2014. 4. S. Glistic, B.Lorenzo – Advanced Wireless Networks. Cognitive, Cooperative and Opportunistic 4G Technology. Wiley & Sons, 2014. | | |
| 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