**DESCRIPTION OF A STUDY COURSE – SYLLABUS**

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| **Title of a course** | **Signals and Systems** | | | | |
| **Study programme** | **Professional undergraduate study Telematics** | | | | |
| **Status of a course** | Obligatory | | | | |
| **Year of study** | 1 | **Semester** | S | **ECTS credits** | 5 |
| **Goals of a course** | | | | | |
| Acquisition of specific competencies in the field of signal and system analysis. From general competences, developing the ability to analyze and synthesize, work independently and work in small groups (team work) and present the achieved results. | | | | | |
| **Conditions for enrolling course** | | | | | |
| No conditions | | | | | |
| **Expected learning outcomes on a level of a course** | | | | | |
| 1. Describe basic signals, their properties, transformations and sampling. 2. Analyse systems in time and frequency range, with linearization and block view. 3. Compare different manners of filtering, sampling, modulating and multiplexing signals. 4. Explain the basics of transducers for the measurement of electrical and non-electrical values. 5. Distinguish different types of real signals. | | | | | |
| **Content of a course** | | | | | |
| IT description of a communicative system. Entropy and information content. An outline and types of signals: continuous, discreet and digital. The linear transformations system. Correlation and convolution. Characteristics of random signals and noise. Spectral density. Channel capacity. SISO and MIMo channel models. Boundaries of a safe information transfer. IT features and principles of medium coding: language, sound, image and video. Characteristics of the speech signal. Speech coding. Image coding. Procedures of compressing the image. Basics of modulation processes. Time continuous modulation and time discreet modulation. Multiplexing principles: space-division multiplexing, frequency-division multiplexing, time-division multiplexing and wavelength-division multiplexing. Orthogonal frequency division multiplex. OFDM modulation procedures. | | | | | |