Title	Code
Digital Signal Processing	**POZ04WTS2ICC10**
Field: **Electronics and Telecommunications**	Year / Semester: **autumn**
Specialty: **Information and Communication Technologies**	Course: **core**
Hours: Lectures: **2** Classes: **2** Laboratory: **-** Projects / seminars: **-**	Number of credits: **5**

Lecturer:

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Status of the course in the study program:

Compulsory course on Electronics and Telecommunications studies, specialization Information and Communication Technologies

Objectives of the course:

Understanding of digital representation of signals as a series of samples, signal processing algorithms, analog and digital signal processing - similarities and differences.

Course description:

Comparison of digital and analog signal processing techniques. Sampling, sampling theorem. Signal quantization. z-transform. Discrete linear systems theory. Discrete-time Fourier transform and Discrete Fourier transform. Structures of digital filters, effects of digital filters coefficient quantization. Design of FIR filters (windowing method, equiripple filters, frequency-domain design), and design of IIR filters (impulse response-invariant method, bilinear transform method). Fast Fourier transform and its application to fast convolution and filtering algorithms. Multirate systems and filter banks. Interpolation and decimation. Stochastic signal processing - non-parametric power spectrum density estimation.

Initial knowledge:

Analog signal processing theory, system theory.

Teaching methods:

Lectures supported by multimedia presentations.

Assessment methods:

Exam ending the lecture.

Bibliography:

1. Digital Signal Processing, J.G. Proakis, D.G. Manolakis, Pearson – Prentice-Hall (there are several editions of this book).
2. Discrete-Time Signal Processing, A.V. Openheim, R.W. Schafer, Prentice-Hall, e.g. 1999.