

Title <b>Signal Processing Basics and Algorithms II - DSP</b>	Code <b>1018071510108310153</b>
Field <b>Electronics and Telecommunications</b>	Year / Semester <b>3 / 5</b>
Specialty -	Course <b>core</b>
Hours Lectures: - Classes: - Laboratory: <b>2</b> Projects / seminars: -	Number of credits <b>2</b>
	Language <b>polish</b>

**Lecturer:**

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**Status of the course in the study program:**

Compulsory course on Electronics and Telecommunications studies.

**Assumptions and 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.

**Contents of the course (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). Multi-dimensional systems. Fast Fourier transform. Multirate systems and filter banks. Interpolation and decimation. Stochastic signal processing - non-parametric power spectrum density estimation.

**Introductory courses and the required pre-knowledge:**

Analog signal processing theory (first part of the course), system theory

**Courses form and teaching methods:**

Lecture - 45 hours per semester, laboratory (30 hours) based on MATLAB system, and digital signal processor kits.

**Form and terms of complete the course - requirements and assessment methods:**

Exam ending the lecture, individual laboratory projects.

**Basic Bibliography:**

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**Additional Bibliography:**

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