

Title Metrology and Experimental Techniques	Code 1018071310108010137
Field Electronics and Telecommunications	Year / Semester 2 / 3
Specialty -	Course core
Hours Lectures: 3 Classes: - Laboratory: 1 Projects / seminars: -	Number of credits 4
	Language polish

Lecturer:

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Status of the course in the study program:

Obligatory course for students of Electronics and Telecommunications.

Assumptions and objectives of the course:

Introduction to the basis of metrology terminology, measurements methods and equipment. To provide students with the skills for analyze experimental data and present results of measurement. To introduce students to practical laboratory experience of prepare, organize, conduct measurements and to the main components of modern measurement systems such as sensors, signal conditioning circuitry, data acquisition components and interfaces.

Contents of the course (course description):

Basic definitions and terms of metrology. Methods, principles and procedures of measurements. Sources of errors. Identification of systematic errors. Statistics in metrology. Point and range estimation. Uncertainty and error in direct and indirect measurements. Calculation of the total standard uncertainty. Measurements with analog and digital oscilloscopes. Digital measurements of frequency and period. Analogue and digital measurements of voltage, current and resistance. Metrological attributes of modern measuring instruments. Selected characteristics of analog and digital measurements. Conditioning circuitry and intelligent digitizing signal conditioners. Digital to analog converters (DAC?s). Analog to digital converters (ADC?s): the dual ramp ADC; flash , successive approximation and sub-ranging types. ADC errors. Components of data acquisition systems. Automatization of measurement process. Measurement systems and computer-aided measurements.

Introductory courses and the required pre-knowledge:

Fundamentals of mathematics, physics and circuit theory.

Courses form and teaching methods:

Lectures illustrated by multimedia presentations, laboratory with 6 experiments.

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

Tests in laboratory, written and oral examination.

Basic Bibliography:

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Additional Bibliography:

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