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| Title Sensor Technology and Imaging of Objects | Code 10103212710103201231 |
| Field Electrotechnics | Year / Semester 4 / 7 |
| Specialty Measuring Systems in Industry and Biomedical Engineering | Course core |
| Hours Lectures: 2 Classes: - Laboratory: 3 Projects / seminars: - | Number of credits 7 |
| Language polish | |

Lecturer:

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Status of the course in the study program:

Obligatory course, Faculty of Electrical Engineering, field Electrotechnics, speciality Measuring Systems in Industry and Biomedical Engineering

Assumptions and objectives of the course:

The student should obtain the knowledge about: modern measuring systems to be applied in studies of nonelectrical quantities, including biophysical quantities, as well as modern methods of image acquisition and analysis.

Contents of the course (course description):

Sensor technology: definitions, terms, quantities, units of measurement, parameters, specific phenomena. Principles and examples of operation of sensors for measuring selected quantities such as: temperature, pressure, force, acceleration, frequency, linear shift, position, rotational speed, spectrum, humidity. Approach detection. Indirect measurement of currents with the Rogowski's coil and pincers transformer based on Hall generator. Radiometry and photometry. Investigation of light flickering. Metrological attributes and testing of selected modern measuring and monitoring equipment for biophysical applications. Modern methods of imaging used in technology and medicine: thermovision, thermography, ultrasonography, computer tomography (CT), magnetic resonance (MRI), X-ray imaging (RTG), fiberoscopy and endoscopy, CCD converters. Devices for acquiring images with visible radiation (CMOS and CCD cameras). Configuration of vision systems for image acquisition with analog and digital cameras. Selecting the camera optical systems. Formats of graphical files and methods of data compression. Methods of image digital processing.

Introductory courses and the required pre-knowledge:

Fundamentals of electrotechnics, metrology, electronics and signal theory.

Courses form and teaching methods:

Lectures, laboratory exercises.

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

Reports on laboratory exercises, an exam.

Basic Bibliography:

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Additional Bibliography:

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