Title	Code
Construction of Research Apparatus (Bud. aparat. badawczej)	**1010401241010420704**
Field: **TECHNICAL PHYSICS**	Year / Semester: **2 / 4**
Specialty: **-**	Course: **core**
Hours: Lectures: **2** Classes: **-** Laboratory: **-** Projects / seminars: **1**	Number of credits: **5**
	Language: **polish**

Lecturer:

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Status of the course in the study program:

Core course of the study for Technical Physics, Faculty of Technical Physics.

Assumptions and objectives of the course:

- Acquaintance of the students with the basic problems concerning engineering design of scientific instruments with special regard to optical spectroscopy apparatus.

Contents of the course (course description):

- Geometrical an wave optics fundamentals. Properties of optical materials. Absorption and dispersion. Phenomena at a boundary of optical media. Parameters of the basic optical components. Image formation by mirrors and lenses. Optical aberrations. Interference of light in plane-parallel plate. Antireflection coatings. Multilayer dielectric mirror coatings. Interference filters. Photometric and radiometric quantities. Blackbody radiation. Light sources and their properties. Dispersing prism and diffraction grating. Build and parameters of optical spectrometer. Detectors of light. Signal processing in optical spectroscopy instruments. Selected electronic circuits used in scientific instruments. Analog-to-digital conversion of measuring signals. Construction of contemporary spectroscopy instruments.

Introductory courses and the required pre-knowledge:

- Knowledge of experimental physics and mathematics at the core course for engineering students level. Basic knowledge of engineering graphics and theory of passive electric circuits.

Courses form and teaching methods:

- Lectures supported by multimedia presentations. Laboratory practice with the use of computers. Projects.

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

- Lectures - evaluation of written work accomplished in 15th week of the course. Current evaluation of exercises accomplishment. Evaluation of project at the end of the course.

Basic Bibliography:

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Additional Bibliography:

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