

Title <b>Elective course II (Wykład specjalistyczny (obieralny))</b>	Code <b>1010402231010420680</b>
Field <b>TECHNICAL PHYSICS</b>	Year / Semester <b>2 / 3</b>
Specjalty -	Course <b>elective</b>
Hours Lectures: <b>2</b> Classes: -    Laboratory: -    Projects / seminars: -	Number of credits <b>4</b>
	Language <b>polish</b>

**Lecturer:**

dr Bogusław Furmann  
Katedra Inżynierii i Metrologii kwantowej  
Wydział Fizyki Technicznej  
60-965 Poznań, ul. Nieszawska 13B  
tel. (61) 665 3226, fax: (61) 665 3239  
e-mail: boguslaw.furmann@put.poznan.pl

**Faculty:**

Faculty of Technical Physics  
ul. Nieszawska 13A  
60-965 Poznań  
tel. (061) 665-3160, fax. (061) 665-3201  
e-mail: office\_dtpf@put.poznan.pl

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

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

**Assumptions and objectives of the course:**

Acquaint students with selected applications of the lasers in scientific research, medicine and technics.

**Contents of the course (course description):**

There are presented selected examples of the applications of the lasers, requirements which needs to satisfy of the lasers in these applications and examples of the typically lasers application setups.

Subject of the lectures:

Laser hazards and safety. Lasers applied in medicine

Lasers ophthalmology, refractive surgery, thermal treatments of tumours

Laser in vascular surgery

Laser in medical diagnostics, dermatology, hardtissue/dentistry and other medical applications

Lasers in satelite ranging and atmospheric remote sensing

Lasers spectroscopy of the atoms, molecules and solid state. Doppler limited and subdoppler spectroscopy methods. Time resolved spectroscopy

Lasers cooling and trapping. Ions traps, magneto-optical traps, optical nets

Atomic clocs on fountain, ions traps and optical nets. Global Positioning Systems.

Lasers in analyse of the materials and isotope separations

Lasers in materials technology. Driling, micromachining, cutting, welding, marking.

Saving, transforming and reading information by the use of lasers. Blue Rye, DVD, CD recorders, laser printers, holography

Metrological applications of the lasers, interpherometry, anemometry, gyroscopy.

Military application, lasers termonuclear synthese

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

Basic knowledge of physics at the engineering studies areas level.

**Courses form and teaching methods:**

Lectures supported by films, and slides.

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

Written and oral tests.

**Basic Bibliography:**

1. R. Nowicki ?Technika laserowa i jej zastosowanie?, Oficyna Wydawnicza P.W., Warszawa 2009
2. A. Dubik ?Zastosowanie laserów?, WNT, Warszawa 1992
3. P. Fiedor, ?Zarys klinicznych zastosowań laserów? Dom wydawniczy Ankar, Warszawa 1995
4. T. Kęcik ?Lasery w okulistyce?, PZWL, Warszawa 1984
5. W. Demtroder ?Spektroskopia laserowa?, PWN, Warszawa 1992
6. M. Nowicki ?Lasery w technologii elektronicznej i obróbce materiałów?, WNT, Warszawa 1978
7. W. Wyrębski, ?Laserowa technika wojskowa?, BWW, 1982

**Additional Bibliography:**

-