Level: master

Course title: Physics and Techniques of lasers

Status: elective

ECTS: 9

Requirements: Quantum mechanics, Atomic physics

Learning objectives

Students should learn and master the basic knowledge on the laser and laser techniques.

Learning outcomes

After completing the course, students should possess:

- General skills: knowledge which is useful in various areas related to the application of lasers.
- Specific skills: mastered principles of different types of lasers. Students are familiar with the characteristics of laser radiation and the interaction of radiation with matter.

Syllabus

Theoretical instruction

Stimulated emission of radiation. Optical amplifier and generator. Generation of laser radiation. Characteristics of laser radiation. Optical resonators and oscillation modes. Types and characteristics of the lasers. Gas lasers. Ion lasers. Liquid lasers. Solid state lasers. Semiconductor lasers. Powerful lasers. The interaction of laser radiation with matter. Protection from laser radiation. Detectors of laser radiation.

Practical instruction

Electrical Power supply and trigger system. Structural elements of the laser. Experimental determination of the radiation properties of helium-neon laser. Protection from laser radiation.

Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 1 seminars	Student research:	