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| Level: bachelor | | | | |
| Course title: Fundamentals of laser physics | | | | |
| Status: elective | | | | |
| ECTS: 6 | | | | |
| Requirements: | | | | |
| Learning objectives Introducing students to the theory of radiation, basic atomic and molecular processes in laser areas, the basics of laser systems and laser techniques in various fields of science, technology and medicine. | | | | |
| Learning outcomes Introducing the students to: - Basic knowledge of the physics of lasers to follow the professional and scientific literature, - Methods of application laser radiation in various fields of human activities. Students learn to work with the simplest laser systems. | | | | |
| Syllabus <i>Theoretical instruction</i> Introduction to laser physics. History of lasers. Spontaneous and stimulated processes. Population inversion. Principles of laser operation. Laser beam characteristics. Laser resonators and modes. Types of lasers: gas lasers, solid state lasers, liquid lasers, semiconductor lasers, laser diodes, modern types of lasers. Natural lasers in space. The interaction of laser radiation with matter. Laser radiation detectors. Laser safety. Laser fusion. The application of lasers in science, technology, medicine and environment. <i>Practical instruction</i> The exercises that follow the content of lectures. | | | | |
| Weekly teaching load | | | | Other: |
| Lectures: 3 | Exercises: 1 | Other forms of teaching: 1 | Student research: | |