Study: Physics

Type and level of studies: Bachelor studies

Course name: Optics

Lecturer**: Milić A Gordana**

Status: Compulsory

ECTS: 6

Attendance prerequisites: Electromagnetism

Course aims

Acquiring basic knowledge in the field of optics.

Course outcome

Introduction to the nature and properties of light and its application in optical instruments.

Course content

Theoretical part

Nature and properties of light. The amplitude of the light wave. Speed of light. Photometry. Photometric quantities and units. Lambert's cosine law. Spectral sensitivity of the eye. Refractive index. Phase and group velocity. Doppler effect in light. Fermat's principle. Basic laws of geometric optics. Spreading light. The law of reflection of light. The law of refraction of light. Light dispersion. Total reflection of light. Thin fiber optics. Fundamentals of geometrical optics. Flat mirrors. Spherical mirror. Graphical methods of image construction in a spherical mirror. Refraction of light on a flat surface. The passage of light through a plane-parallel plate. The passage of light through a prism. Refraction of light on a spherical surface. Optical lenses. Graphical methods for lenses. Lens system. Aberrations of optical systems. The eye and its function. Optical instruments. Electron microscope. Wave (physical optics). Light interference. Newton's rings. Standing waves. Light diffraction. Polarization of light. Quantum nature of radiation. Kirchhoff's and Stefan's - Boltzmann's law of radiation. Rayleigh-Jeans formula. Planck's law of radiation. Photoelectric effect. Photon mass and momentum. Light pressure. Compton effect.

Practical Part:

Exercises - computational and experimental exercises which are in accordance with the theoretical classes.

Literature

1. Ивановић Д., Вучић М.: Физика II, Грађевинска књига, Београд
2. Димић Г., Митриновић М.: Збирка задатака из физике, Београд 1998
3. Б. Павловић, Ц. Милојевић. Практикум рачунских вежбања из физике, Београд 1979.

Number of active classes				Other classes
Lectures: 2	Practical classes: 1	Other forms of teaching:		

Teaching methods

Lectures (2 classes per week during the semester), calculation exercises (1 classes per week during the semester), laboratory exercises (1 classes per week during the semester).

Assessment (maximum 100 points)

Course assignments	**points**	Final exam	**points**
Lectures	5	Written exam	30
Practical classes	5	oral exam	40
Laboratory exercises	20	.....	
Total	30		70