Study program: Special Education and Rehabilitation, module of Visual Impairments

Type and level of studies: Basic Academic Studies

Title of the subject: Physiological Optics

Lecturer: Dragomir M. Stamenković

Course status: Obligatory

ECTS: 5

Prerequisites: Passed exam Ophthalmology

Aim:

To acquire theoretical and practical knowledge in geometric optics as a branch of physics and understanding the functioning of the eye as an optical system. Study of the quality of the image (aberration of the eye optical system) as well as the optical aspects of visual perception, refraction and refraction anomalies.

Outcomes:

More comprehensive examination of the eye as an optical system, the quality of visual perception and the application of acquired knowledge in the study and correction of ametropic conditions.

Content

Lectures: The nature of light. Basic concepts and laws of geometric optics. Gaussian optics. Optical diopter and optical elements (lenses, mirrors, prisms). Cardinal points of the optical system. The theory of image formation and the quality of the image - the theory of aberration. Eye as an optical system and the formation of the image on the retina. Visual perception and contrast sensitivity. Photometry of vision. Optical aspects of refraction and refractive anomalies of the eye. Optical aspects of accommodation, binocular and color vision. Optical aspects of vision impairments.

Practical work: Exercises in geometric optics - the basis of the optical calculus (cardinal points, position of the image, increment and magnification). Geometric aberrations (chromatism, spherical, coma, astigmatism, distortion). Demonstration and practical work with basic optical elements and optical systems - lenses, magnifiers, microscopes.

Literature

1. Vasiljević, D. (2004). *Optički uređaji i optoelektronika* (str 1-64). Beograd: Mašinski fakultet. ISBN 86-7083-493-6.
2. Parunović, A. (1997). *Upoznajte svoje oči*. Beograd: Zavod za udžbenike i nastavna sredstva. ISBN 86-17-06103-0.
3. Parunović, A., Cvetković, D. (1995). *Korekcija refrakcionih anomalija oka* (str. 1-120). Beograd: Zavod za udžbenike i nastavna sredstva. ISBN 86-17-04525-6.
4. Hribar-Košir, A. (2002). *Priročnik za očesno optiko* (стр. 1-112). Carl Zeiss Maribor, 681.7(035).
5. Atchison, D. A., Smith, G. (2000). *Optics of the Human Eye*. Butterworth Heinemann, ISBN 0-7506-3775-7.
6. Rosenfield, M., Logan, H. (2009). Optometry: science, techniques and clinical management. ELSEVIER. ISBN 978-0-7506-8778-2.

Number of active classes per week:	**Lecture: 2**	**Practical work: 2**

Teaching methods:

Demonstratively-illustrative method. Practical exercises in the ophthalmic cabinet and the visually impaired center.

Evaluation of knowledge (maximum score 100)

Pre obligations	**Score**	**Final exam**	**Score**
activities during the lectures	**10**	written exam	**25**
practical teaching	**10**	oral exam	**25**
midterm(s)	**15**		
seminars	**15**		