

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES
AT VILNIUS UNIVERSITY**

Subject (module) title/ code	Medical and Health Sciences (M 000): Medicine (M 001)			
Faculty, Institute, Cathedral /Clinic	Faculty of Medicine Institute of Biomedical Sciences Clinic of Ear, Nose, Throat and Eye Diseases			
Subject (module) description (ECTS credits, hours)	Ophthalmological Investigational Methods 8 credits (216 hours)			
Subject (module) studies design	Lectures	Seminars	Consultations	Self-study hours
ECTS credits	-	-	2	6
Assessment strategy (10 points system)	Written exam: 3 themes are reviewed (doctoral student has to present theoretical knowledge, explain their practical application, introduce the theme actualities).			
PURPOSE OF THE COURSE UNIT				
<p>To acquaint with the anatomical and functional features of the eye, the variety of ophthalmological examinations, the principles of diagnosis of eye diseases. To provide theoretical and practical knowledge about clinical and instrumental research of the eye and its associated organs: the principles of their function, performance techniques, indications, evaluation of results and innovations. Promote research-based and individual patient-centered diagnostics and monitoring of disease progression and evaluation of treatment effects.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p>Anatomy, histology and development of the eyeball and ocular adnexa. <u>The investigations fo the visual function.</u> Visual acuity test methods. Visual field examination methods. Perimeter types: static, kinetic, frequency duplication, color; indication for perimetry, interpretation of visual field defects, differential diagnostics. Color vision tests. Sensation of light, its disorders, methods of determining contrast sensitivity. Binocular vision, its assessment methods. Forms of clinical refraction, its determination. Subjective and objective clinical refraction studies. Investigational methods of accommodation disorders. Amsler grid test.</p> <p><u>Clinical investigations of the eye and its adnexa.</u> External eye examination, examination with side lighting, diaphanoscopy. Eye biomicroscopy, slit lamp structure, principles of operation, different lighting techniques and indications for them. Gonioscopy, its indications, performance technique, evaluation of the anterior chamber angle structures. Direct and indirect ophthalmoscopy, principles of their performance, evaluation and documentation of fundus structures. Tonometry: types, technique, indications. Principles of intraocular pressure measurement. Investigational techniques and evaluation of corneal surface integrity and tactile sensitivity. Normal and pathological pupilar response to light, test methods. Differential diagnosis of anisocoria. Examination of eye movements. Squint, its forms, diagnosis of variability. Nystagmus, its forms, clinic, research methods, differential diagnostics. Tear drainage system tests, their indications, performance techniques and evaluation of the results. Tear secretion, tear film stability and tear quality studies. Eyelid position evaluation methods.</p>				

Instrumental examinations of the eye and its adnexa. Keratometry and keratotopography, principles of their methodology, indications and interpretation of the results. Pachymetry, its methods and performance, evaluation of corneal thickness, importance in the diagnostics of cornea and glaucoma. Corneal endothelium specular microscopy, indications, evaluation of corneal endothelial condition. In vivo confocal microscopy of the cornea, its indications. Eye biometrics, principles of intraocular lens selection. Optical coherent tomography, its operation principles, types, performance technique. Indications for optical coherent tomography of the anterior and posterior segments, evaluation of tomograms, importance for the diagnosis and monitoring of corneal, retinal and glaucoma diseases. Scanning laser polarimetry. Confocal scanning laser ophthalmoscopy. Peculiarities of autofluorescence, fluorescent and indocyanine green angiography, indications, interpretation of results.

Ocular ultrasound examination. Principles and methodology of ocular ultrasound examination. Indications for ocular ultrasound. Evaluation of ocular echograms: diseases of the anterior segment, vitreous, retina, choroid, scleral diseases, eye tumors. Doppler examination of ocular blood circulation, its indications. Ultrasound biomicroscopy, its indications.

Visual electrophysiology tests. Electroretinography, electrooculography, visual evoked potentials. Types of electroretinography, indications, evaluation of normal and pathological electroretinogram.

Radiological examinations of the eye and its adnexa. Ophthalmic indications for radiographic and magnetic resonance imaging, interpretation of these investigations. Importance of radiological examinations for the diagnosis of eye injuries. Indications for neurophthalmic radiological examination of the brain and orbits.

Diagnostics of ocular tumors. Eyelid tumors, their differential diagnostics. Conjunctival degenerations and tumors, their differential diagnostics. Uveal tumors, their diagnostic methods. Diagnosis of retinal and optic nerve tumors. Biopsy and pathohistological tissue studies in oncophthalmology.

Microbiological examination of eye diseases. Compound microscopic examination of culture and antigens, their indications, technique and evaluation of the results. Indications and methodology of corneal scraping, microscopic examination of corneal scrapings, culture and PCR. Differential diagnosis of ocular surface infections. Vitreous aspiration biopsy, its indications.

RECOMMENDED LITERATURE SOURCES

1. Basic and clinical science course 2021-2022. American Academy of Ophthalmology; 2021.
2. Yanoff M., Duker J. Ophthalmology, 5th edition. Elsevier. 2018.
3. Tasman et al. Duane's ophthalmology and DVD-ROM. Lippincott Williams and Wilkins; 2013.
4. Salmon J. Kanski I. Clinical ophthalmology, 10th edition. Elsevier; 2021.
5. Jašinskas V, Blužienė A. Akių ligų vadovas. A.S. Narbuto leidykla; 2005.
6. Jackson T.L. Moorfields Manual of Ophthalmology, 3rd edition. JP Medical Ltd; 2019.
7. Lee J.S. Primary Eye Examination: A Comprehensive Guide to Diagnosis. Springer; 2019.
8. Gologorsky D., Rosen. R. Principles of Ocular Imaging. Slack Incorporated; 2021.
9. Algaeed A.H., Kozak I. Clinical Atlas of Ophthalmic Ultrasound. Springer; 2019.
10. Skalicky S.S. Ocular and Visual Physiology. Springer; 2016.
11. Schuman J.S., Fujimoto J.G., Duker J.S., Ishikawa H., Wollstein G. Optical Coherence Tomography of Ocular Diseases. SLACK Incorporated; 2022.

CONSULTING LECTURERS
1. <u>Coordinating lecturer</u> : Rimvydas Stanislovas Ašoklis (assoc. Prof. PhD).
2. Andrius Cimbalas (assoc. Prof. PhD).
3. Saulius Galgauskas (assoc. Prof. PhD).
APPROVED:
By Council of Doctoral School of Medicine and Health Sciences at Vilnius University: 29 th of September 2022
Chairperson of the Board: Prof. Janina Tutkuvienė