

MEDICAL UNIVERSITY – PLOVDIV
FACULTY OF MEDICINE

SYLLABUS

IN

Ophthalmology

Approved by the Department Council on 13.06.2022

Confirmed by the Faculty Council - Protocol №6/15.06.2022

Syllabus

Discipline	Final exam/ semester	Auditorium classes				ECTS non-auditorium classes	ECTS total	Academic hours in years and semesters	
		Total	Lectures	Practices	ECTS			4th year	
Ophthalmology	VII							VII	VIII
		75	30	45	2.5	1.2	3.7	2/3	

DISCIPLINE:

Ophthalmology

TYPE OF DISCIPLINE ACCORDING TO THE UNIFORM STATE REQUIREMENTS:

Mandatory

LEVEL OF QUALIFICATION:

Master

FORMS OF TRAINING:

Lectures, seminars, practice

YEAR OF TRAINING:

IV

DURATION OF TRAINING:

1 semester

ACADEMIC HOURS:

30h lectures, 45h practical classes

TECHNICAL EQUIPMENT APPLIED IN THE TRAINING:

Well - equipped classrooms, examination rooms, audiovisual equipment, multimedia discussions, demonstration of examination techniques, diagnostics and treatment.

FORMS OF EVALUATION:

Current control - weekly test, oral interview, review test.

EVALUATION CRITERIA:

Written examination, oral examination.

ASPECTS OF EVALUATION CRITERIA:

Participation in the weekly tests, results from the final test

SEMESTER EXAM:

Written examination, oral examination.

STATE EXAM:

No

LECTURER:

Assoc. Prof. Marin Atanassov, MD, PhD, FEBO

DEPARTMENT:

Ophthalmology

ANNOTATION

History and the subject of ophthalmology. Anatomy of the visual organ. Key features of the visual organ. Light perception. Color vision. Central and peripheral vision. Refraction of the eye and its anomalies. Diseases of the orbit and eyelids. Diseases of the lacrimal apparatus and conjunctiva. Diseases of the cornea and sclera. Diseases of the uvea. Diseases of the lens. Glaucoma. Diseases of the retina. Paediatric ophthalmology. Eye movement disorders. Eye injuries. Ocular manifestations of general diseases. Emergency in ophthalmology. Blindness and its problems.

BASIC AIMS OF THE DISCIPLINE

1. Knowledge of anatomy and physiology of the visual organ.
 2. Systematic approach to examination of the eye and its adnexa.
 3. Understanding and free use of terminology in ophthalmology.
 4. Quality theoretical and practical training in ophthalmology.
 5. Knowledge of ocular pathology.
 6. Excellent knowledge of emergencies in ophthalmology and principles of first aid.
- Master the necessary theoretical and practical skills in ophthalmology. Detection of refractive errors, physiology and pathology of the eyeball. Obtaining the necessary practical skills.

EXPECTED RESULTS

➤ *Theoretical knowledge:*

1. Anatomy of the visual organ.
2. Key features of the visual organ.

3. Light perception. Color vision.
4. Central and peripheral vision.
5. Refraction of the eye and its anomalies.
6. Diseases of the orbit and eyelids.
7. Diseases of the lacrimal apparatus and conjunctiva.
8. Diseases of the cornea and sclera.
9. Diseases of the uvea.
10. Diseases of the lens.
11. Glaucoma.
12. Diseases of the retina.
13. Paediatric ophthalmology.
14. Eye motility disorders.
15. Eye injuries.
16. Ocular signs in general diseases.
17. Emergency in ophthalmology.
18. Blindness and its problems.

Practical skills:

1. *Exposure of the conjunctiva*
2. Expression of tear sac
3. Canal and nasal test
4. Fluorescein staining test
5. Examination of corneal sensitivity
6. Biomicroscopy
7. Retroillumination
8. Indirect ophthalmoscopy (principle and performance)
9. Examination of color vision
10. Examination of visual acuity, perception and projection of light
11. Confrontation method for examination of visual field
12. Measurement of intraocular pressure by palpation
13. Recognizing types of corrective lenses
14. Eye drops instillation
15. Eye ointments application
16. Patching and Dressings
17. Lavage of the conjunctiva
18. Tonometry - Goldman and Shiotts / principles and performance /

LECTURES

LECTURE 1 - 2 HOURS

SUBJECT AND HISTORY OF OPHTHALMOLOGY.

LIGHT PERCEPTION. COLOR VISION

1. Definition and subject of ophthalmology.
2. Meaning of ophthalmology.
3. Features of ophthalmology
 - High demand for ophthalmic care
 - Complex character
 - Close liaison with other medical specialties
4. History of ophthalmology
 - Prehistoric times
 - Ancient civilizations: Assyria and Babylonia, Ancient Egypt, Judaic culture, Ancient Indian culture; Ancient Chinese culture, ancient cultures in America.
 - Classical civilizations: Greece, Alexandria, Rome.
 - Ages: Byzantium, the Arab Ophthalmology; European ophthalmology ...
 - Renaissance and later eras
 - Bulgarian ophthalmology
5. Development of ophthalmological
 - Phylogenesis
 - Ontogenesis
6. Basic functions of the visual organ.
 - Light perception
 - Color vision
 - The form vision
 - Depth perception and stereoscopic vision
7. Essentials of vision
 - Definition of light: theory, photometric units
 - Conversion of light energy into nerve impulses
8. Light perception
 - Definition: absolute sensitivity, discriminative sensitivity
 - Adaptation: to light and dark, methods for examination of adaptation
 - Disturbances in adaptation (hemeralopia, nyctalopia): symptomatic, functional.
9. Colour perception.
 - Definition
 - Spectral colors
 - Characteristics of color: Hue, luminance, saturation
 - Basic colors: red, green, blue

- Additional colors
- Complimentary colors
- Theories of color vision
- Methods for examination of color vision

LECTURE 2 - 2 HOURS

ANATOMY OF THE EYEBALL.

CENTRAL AND PERIPHERAL VISION.

I. Anatomy the eyeball.

1. Anatomy of orbit

- Composition of the orbit
- Features of the walls of the orbit
- Major openings in the orbit
- Contents of the orbit
- Changes in the position of the eyeball

2. Anatomy of the eyelids.

3. Anatomy of the conjunctiva.

4. Anatomy of the cornea

5. Anatomy of the uvea

- Iris
- Ciliary body
- Choroid

6. Anatomy of the lens.

7. Anatomy of the vitreous.

8. Anatomy and histology of the retina.

II. Central and peripheral vision.

1. Central vision: Visual acuity, visual angle.

- Visual charts: Snellen, Monoyer, examination of visual acuity.

2. Peripheral vision.

- Definition
- Visual field
- Importance of the visual field for clinical practice
- Historical development of methods for analysis of visual field
- Methods for subjective field of vision: a control (confrontation method of Donders, campimetry, perimetry - kinetic, static
- Objective methods for testing the visual field.

LECTURE 3 – 2 HOURS

REFRACTION OF THE HUMAN EYE. ACCOMMODATION. REFRACTIVE ERRORS

1. Similarities between human eye and photocamera
2. Physical optics. Physical refraction. Physiological optics
3. The human eye as an optical system

4. Clinical refraction
 - Emmetropia
 - Myopia
 - Hyperopia
5. Causes for ametropias: theories, types of ametropia
6. Static and dynamic clinical refraction
 - far point of view in different clinical refractions
7. Accommodation
 - definition
 - near point of view
 - mechanism of accommodation
 - field of accommodation
 - range of accommodation
8. Presbyopia
9. Pathology of accommodation: paralysis and spasm of accommodation
10. Astigmatism
 - simplex astigmatism
 - compound astigmatism
11. Methods for refraction testing
 - subjective methods
 - objective methods
12. Correction of refractive errors
13. Myopia – clinical presentation
14. Hyperopia – clinical presentation

LECTURE 4 – 2 HOURS

DISEASES OF THE ORBITA.

- I. Diseases of the orbit.
2. Congenital diseases of the orbit.
 - Craniodystososes - meningocele and encephalocele
3. Vascular diseases of the orbit.
 - Oedema of the orbit
 - Bleeding and hematoma of the orbit
 - Intermittent exophthalmus (proptosis)
 - Pulsating proptosis
4. Inflammation of the orbit.
 - Anterior and posterior osteoperiostitis of the orbit
 - Orbital cellulitis
 - Thrombophlebitis of the orbit
 - Orbital phlegmona
 - Panophthalmitis
 - Tenonitis: serous and purulent
5. Parasitic diseases of the orbit.
 - Trichinosis
 - Echinococcosis
6. Endocrine orbitopathy
 - Thyroid associated orbitopathy (TAO)
 - Endocrine ophthalmopathy

7. Tumours of the orbit

- Benign: dermoid cyst, holoosteoma, angioma,
- Malignant: sarcoma, carcinoma, glioma, meningioma lymphoma

LECTURE 5 - 2 HOURS

DISEASES OF THE EYELIDS AND THE LACHRYMAL SYSTEM

1. Diseases of the eyelids.
2. Function of the eyelids.
3. Diseases of the eyelids
 - Congenital anomalies
 - Diseases of the eyelid skin: noninflammatory and inflammatory
 - Diseases of eyelashes
 - Static and dynamic disorder of the eyelids: entropion, ectropion, blepharospasm, lagophthalm, ptosis of eyelids
 - Eyelid tumors: benign and malignant.

Diseases of the lacrimal apparatus

1. Significance and composition of the tear film. Types of tear secretion
2. Anatomy of lacrimal apparatus: lacrimal gland and lacrimal drainage system
3. Diseases of the lacrimal gland
 - Acute dacryoadenitis
4. Diseases of lacrimal drainage system
 - Congenital and acquired changes of lacrimal puncta
 - Canaliculitis
 - Acute dacryocystitis

LECTURE 6 – 2 HOURS

DISEASES OF THE CONJUNCTIVA AND KERATOKONJUNCTIVITIS

Diseases of the conjunctiva

1. Frequency and significance of conjunctival diseases
2. Function of the conjunctiva
3. Morbid changes in the conjunctiva: hyperemia – conjunctival and ciliary, chemosis, folliculae, papillae, phlyctena, discharge – catarrhal, purulent, fibrinous
4. Inflammatory diseases of the conjunctiva /conjunctivitis/.
 - Classification: acute, subacute, chronic conjunctivitis; catarrhal, purulent, membranous and pseudomembranous conjunctivitis; allergic conjunctivitis; conjunctival-corneal damage in different skin diseases; other conjunctivitides
 - Acute catarrhal conjunctivitis: aetiology, clinics, treatment
 - Purulent conjunctivitis /gonorrhoeic/
 - Membranous /diphtheric/ and pseudomembranous conjunctivitis
 - Chronic conjunctivitis
5. Differential diagnosis between conjunctivitis and keratitis.

6. Phlyctenulous keratoconjunctivitis

- etiology
- clinical signs
- treatment

7. Vernal keratoconjunctivitis

- etiology
- clinical signs
- treatment

8. Trachoma

- distribution
- etiology
- clinical signs
- differential diagnosis
- complications
- treatment

9. Degenerative diseases of the conjunctiva

- pinguecula
- pterygium.

LECTURE 7 – 2 HOURS

DISEASES OF THE CORNEA

Diseases of the cornea

- Function of cornea
 - Methods for corneal investigation
 - Pathological changes in cornea: opacities – infiltration, cicatrix, degeneration; vascularisation: superficial, deep
1. Changes in corneal shape and size
 2. Inflammatory corneal diseases
 - Superficial nonpurulent keratitides
 - Superficial purulent keratitides
 - Deep /stromal/ keratitides
 - Trophic keratitides
 3. Treatment and consequences of keratitides

LECTURE 8 - 2 HOURS

DISEASES OF THE UVEAL TRACT

I. UVEITIS.

1. Etiology and histopathology of uveitis.

- exogenous agents
- endogenous agents: acute and chronic infectious, non-infectious, focal infectious, immunoallergic, endocrine and genetic mechanisms.

2. Classification of Uveitis

- according to etiology: infectious – exogenous and endogenous, non-infectious
- according to duration: acute, subacute and chronic

- according to exudation: serous, fibrinous, purulent and hemorrhagic
- according to histopathology: granulomatous and nongranulomatous
- according to anatomical localization: Anterior uveitis, Intermediate uveitis, Posterior uveitis and Panuveitis

3. Anterior uveitis

- subjective symptoms
- objective symptoms
- exogenous anterior uveitis
- endogenous anterior uveitis: acute infectious diseases, chronic infectious diseases, focal infectious, metabolic diseases, rheumatological diseases
- therapy of acute anterior uveitis: topical and systemic.

4. Intermediate uveitis.

5. Posterior uveitis (chorioretinitis)

- subjective symptoms
- objective symptoms
- clinical types: diffuse, multifocal, focal, central, peripheral, juxtapapillary
- complications
- therapy

6. Panuveitis

- Tuberculosis
- Syphilis
- Toxoplasmosis
- Sarcoidosis
- Uveitis in non-infectious multi-system diseases
- Ocular involvement in AIDS
- Sympathetic ophthalmia
- Acute purulent uveitis

II. Uveitic tumours.

LECTURE 9 – 2 HOURS **DISEASES OF THE LENS**

1. Function of the lens.
2. Methods for examination.
3. Diseases, connected with changes in lens'location.
 - ectopia lentis
 - luxation and subluxation of the lens
4. Diseases, connected with changes in lens transparency
 - acquired cataract: age-related, traumatic, pathologic, complicated, radiation-induced
 - management of the acquired cataract: medical and surgical
 - congenital cataract: types, clinical features, management.

LECTURE 10 – 2 HOURS **GLAUCOMA**

- I. NATURE OF GLAUCOMA. DEFINITION.
- II. PHYSIOLOGY OF THE AQUEOUS HUMOR.
- III. INTRAOCULAR PRESSURE. METHODS FOR MEASUREMENT.
- IV. ETHIOPATHOGENESIS.
- V. CLASSIFICATION OF THE GLAUCOMAS:

- primary glaucoma: angle-closure glaucomas, open-angle glaucomas, combined mechanism glaucoma
 - secondary glaucoma
 - congenital glaucoma
 - 1. Primary angle-closure glaucoma
 - pathogenesis: relative papillary block, narrowing anterior chamber angle, plateau iris, vitreo-lenticular block
 - clinical features
 - differential diagnosis
 - 2. Open-angle glaucomas
 - types: primary, pseudoexfoliative, pigmentary
 - A. Primary open-angle glaucoma
 - pathogenesis: dystrophic changes in different parts of the aqueous drainage system, combined with partial block of the anterior chamber angle by the iris' root or goniosynechia.
 - clinical features
 - differential diagnosis
 - B. Pseudoexfoliative open-angle glaucoma.
 - C. Pigmentary open-angle glaucoma.
 - 3. Combined forms of glaucoma.
- VI. COMMON FEATURES AMONG THE PRIMARY GLAUCOMAS.
- VII. DIFFERENCES IN THE CLINICAL COURSE OF THE THREE TYPES OF GLAUCOMA
- VIII. MANAGEMENT
- medical
 - surgical
 - laser

LECTURE 11– 2 HOURS

DISEASES OF THE RETINA AND OPTIC NERVE

1. Retinal functions.
2. Diagnostic methods.
3. Classification of retinal diseases.
 - Retinal vascular diseases
 - Retinal inflammation diseases
 - Retinal degenerative diseases
 - Phakomatoses
 - Retinal changes in blood diseases
 - Retinal detachment
 - Retinal tumours
 - Traumatic retinal diseases
 - Congenital retinal diseases
 - Perinatal injuries
4. Symptoms of retinal diseases
 - subjective symptoms

- objective symptoms
- 5. Retinal vascular diseases.
 - haemodynamic disturbances in retinal vessels: acute retinal artery occlusion, acute retinal vein occlusion
 - retinal changes in systemic vascular diseases: Hypertensive retinopathy, Kidney retinopathy, Retinopathy of prematurity, Diabetic retinopathy.
- 6. Inflammatory retinal vascular disease.
- 7. Retinal inflammatory diseases.
 - primary inflammatory retinal diseases: Central serous chorioretinopathy
 - secondary inflammatory retinal diseases: metastatic retinit, tuberculosis retinit.
- 8. Retinal degenerative diseases.
 - Retinal pigment epithelium degeneration
- 9. Retinal detachment
 - Rhegmatogenous retinal detachment
 - Tractional retinal detachment
 - Exudative, tumour retinal detachment
- 10. Retinal tumours – Retinoblastoma.
- 11. Diseases of the optic nerve.
 - Papillary edema
 - Anterior ischemic optic neuropathy
 - Neuritis/papillitis
 - Retrobulbar neuritis

LECTURE 12 – 2 HOURS

OCULAR SYMPTOMS IN SYSTEMIC DISEASE

1. Two-way connection between eye and organism.
2. Importance of the ocular examination in general diseases diagnostics.
3. Ocular manifestations in acute infectious diseases.
4. Ocular manifestations in chronic infectious diseases.
5. Ocular manifestations in collagenosis.
6. Ocular manifestations in endocrine disorders.
7. Ocular manifestations in metabolic disorders.
8. Ocular manifestations in vascular diseases.
9. Ocular manifestations in hematologic disorders.
10. Ocular manifestations in central nervous system disorders.
11. Ocular manifestations in AIDS.

LECTURE 13 – 2 HOURS

OCULAR MOTILITY PROBLEMS, CHILD'S VISION

1. Motility of the eye.
 - Eye muscle movement

- Function of the eye muscles.

2. Binocular vision.

- Prerequisites
- Types
- Retinal correspondence
- Methods of examination of binocular vision.

3. Heteroforia.

- Types
- Clinical manifestations
- Treatment

4. Concomitant squint.

- Types
- Etiology
- Clinical features
- Examination methods
- Treatment: optical, orthoptical, surgical, complex

5. Paralytic squint.

- Etiology
- Clinical features
- Treatment
- Differential diagnosis between concomitant and paralytic strabismus

LECTURE 14 - 2 HOURS

OCULAR TRAUMAS. EMERGENCY IN OPHTHALMOLOGY

1. Frequency and importance of blindness.
2. Types of ocular traumatism: civil, industrial, pediatric, agricultural, military.
3. Classification of ocular traumatism
 - contusions
 - injures: penetrating and non-penetrating – with or without foreign body
 - combustions
- A. Eyelid trauma:
 - contusions
 - injures
- B. Orbital trauma
- C. Globe trauma
 - contusions
 - injures: non-penetrating and penetrating, with or without foreign body
 - explosive injures
- D. Combustions
 - thermal
 - chemical
 - radiation
 - a. Management of combustions: medical, surgical
 - b. General practitioner duties

EMERGENCY AID IN OPHTHALMOLOGY.

1. Emergency aid steps given by the general practitioner (GP) in cases of trauma of the eyeball and ocular adnexa.
2. Emergency aid steps given by the GP in cases of burns.
3. Emergency aid steps given by the GP in cases of occlusion of the central retinal artery.
4. Emergency aid steps given by the GP in cases of thrombosis of the central retinal vein.

5. Emergency aid for acute angle closure glaucoma.
6. Emergency aid for acute iridocyclitis.

LECTURE 15 – 2 HOURS

BLINDNESS – CAUSES AND PREVENTION

1. Definition of blindness.
2. Most common causes of blindness.
3. Types of blindness
 - absolute
 - practic
 - work
 - professional
 - pedagogical
 - monolateral and bilateral
 - reversible and irreversible
4. Problems of blindness
 - moral and ethic
 - social
5. Rehabilitaion of the blind.

Lectures

№	Topic	Hours	Date
1	HISTORY OF OPHTHALMOLOGY. COLOR VISION AND LIGHT PERCEPTION	2	
2	ANATOMY OF THE EYEBALL, CENTRAL AND PERIPHERAL VISION.	2	
3	REFRACTION OF THE EYE, ACCOMMODATION, ANOMALIES OF REFRACTION	2	
4	DISEASES OF THE ORBITA.	2	
5	DISEASES OF THE EYELIDS AND THE LACHRYMAL SYSTEM	2	
6	DISEASES OF THE CONJUNCTIVA AND KERATOKONJUNCTIVITIS	2	

7	DISEASES OF THE CORNEA	2	
8	DISEASES OF THE UVEAL TRACT	2	
9	DISEASES OF THE LENS	2	
10	GLAUCOMA.	2	
11	DISEASES OF THE RETINA AND OPTIC NERVE.	2	
12	OCULAR SYMPTOMS IN SYSTEMIC DISEASE	2	
13	OCULAR MOTILITY PROBLEMS, CHILD'S VISION	2	
14	OCULAR TRAUMAS. EMERGENCY IN OPHTHALMOLOGY	2	
15	BLINDNESS – CAUSES AND PREVENTION	2	

Total: 30 h

PRACTICES

Practice 1 - 3 hours

**ANATOMY OF THE EYEBALL. SYSTEMIC EXAMINATION OF PATIENTS.
FOCAL ILLUMINATION EXAMINATION OF THE CONJUNCTIVA**

I. Anatomy of the eyeball

1. Bulbus oculi – form, poles, meridians, equator

II. Systemic examination of patients

1. Visit to the outdoor patients office: methods of examination of the anterior and posterior segments of the eye, visual charts, correction lenses, direct and indirect ophthalmoscopes, perimeter, tonometer, bio-microscope, instruments.

2. Systemic examination of the patient – history of the disease.

3. Examination of the conjunctiva.

4. Focal illumination.

5. Demonstration of patients: diagnosis, differential diagnosis, treatment. 6. Schematic drawing of the eyeball.

III. Focal illumination –

IV. Examination of the conjunctiva.

PRACTICE 2 - 3 HOURS

PATHOLOGY OF LIGHT PERCEPTION AND COLOR PERCEPTION. PERIPHERAL VISION

I. Light perception

1. Light sensitivity threshold, adaptation.
2. Light perception.
3. Pathology of light perception.

II Color vision

1. Characteristics of colors, principle of pseudochromatism.
2. Examination with the charts of Rabkin.
3. Pathology of color vision.

III. Peripheral vision

1. Anatomical substrate of peripheral vision and limits of the visual field.
2. Examination of peripheral vision, control method of Donders.
4. Diagnosis of visual field anomalies.

PRACTICE 3 - 3 HOURS

CENTRAL VISION. REFRACTION AND REFRACTION ANOMALIES. VISUAL ACUITY.

I. Central vision. Visual acuity.

1. Angulus minimum visibile
2. Visual charts of Snellen, Monoyer.
3. Examination of visual acuity, formula of Donders.
4. Examination of the visual acuity by the students.

II. Refraction and refraction anomalies.

1. Physical optics. Physical refraction. Physiological optics.
2. The eye as an optic system.
3. Clinical refraction: emetropia, myopia, hypermetropia.
4. Accommodation.
5. Presbyopia.
6. Astigmatismus.
7. Methods of examination of the refraction – subjective, objective.
8. Correction of the anomalies of refraction.
9. Symptoms of myopia.
10. Symptoms of hypermetropia..
11. Correction lenses.
12. Skiascopy.

PRACTICE 4 - 3 HOURS

TRANSILLUMINATION. OPHTHALMOSCOPY. SKIASCOPY.

1. Transillumination – demonstration of the technique. Pathology of the transparent media.
2. Practical exercise in transillumination.
3. Ophthalmoscopy – direct and indirect. Principles of ophthalmoscopy.
4. Practical exercise in direct and indirect ophthalmoscopy.
5. Skiascopy.

PRACTICE 5 - 3 HOURS

DISEASES OF THE ORBIT AND EYELIDS..

I. Diseases of the orbit.

1. Congenital diseases of the orbit.
2. Circulatory diseases of the orbit.
3. Inflammatory diseases of the orbit..
4. Parasitic diseases of the orbit.
5. Endocrine diseases with orbital symptoms. орбитни прояви.
6. Malignant and benign tumors of the orbit.

II. Diseases of the eyelids.

1. Congenital anomalies of the eyelids.
2. Diseases of the skin of the eyelids: inflammatory, non inflammatory.
3. Diseases of the eyelashes.
4. Static and dynamic anomalies in the lids position: entropion, ectropion, blepharospasmus, lagophthalmus, ptosis of the eyelids.
5. Malignant and benign tumors of the eyelids.

III. Demonstration of patients.

PRACTICE 6 - 3 HOURS

DISEASES OF THE LACHRYMAL APPARATUS AND THE CONJUNCTIVA.

I. Diseases of the lachrymal apparatus.

1. Acute dacruoadenitis.
2. Congenital and acquired anomalies of the lachrymal puncta.
3. Canaliculitis.
4. Chronic dacryocistitis.
5. Acute dacryocystitis.

II. Diseases of the conjunctiva.

1. Pathologic changes in the conjunctiva: hyperemia- conjunctival and ciliary, edema, follicles, papillas, phlyctenas, secretion – catarrhal, purulent, fibrin.
2. Inflammation of the conjunctiva (conjunctivitis) – acute, mild, chronic conjunctivitis, catarrhal, purulent, membranous, pseudo membranous, chlamidial, allergic conjunctivitis, conjunctiva-corneal damage in skin diseases, other conjunctivitis.

III. Examination of the lachrymal apparatus and conjunctiva:

1. Examination of the lachrymal secretion – Shirmer test.
2. Examination of the lachrymal pathway:
 - Canalicule test
 - nasal test
 - Anel test – demonstration.

3. Evacuation of the contents of the achrymal sac
4. Examination of the conjunctiva.
5. Focal illumination, bio microscopy.

IV. Demonstration of patients.

PRACTICE 7 - 3 HOURS **DISEASES OF THE CORNEA**

1. Pathologic changes in the cornea: opacities – infiltration, cicatrix, degeneration, pathologic vessels: superficial, deep.
2. Changes in the form and dimensions of the cornea.
3. Inflammatory diseases of the cornea:
 - superficial, non purulent keratitis
 - superficial purulent keratitis
 - deep (parenchimal) keratitis
 - trophic keratitis
4. permanent changes after keratitis and their treatment.
5. Examination of the corneal sensitivity.
6. Focal illumination, bio microscopy.
7. Instillation of eye drops and crèmes.

PRACTICE 8 - 3 HOURS

DISEASES OF THE UVEA

1. Normal structure of the iris – examination by focal illumination.
2. Ciliary hyperemia. Differential diagnosis between ciliary and conjunctival hyperemia.
3. Pathologic changes in iridocyclitis – changes of the structure of the iris, precipitates, Tyndall effect, posterior synechiae, opacities. Differential diagnosis between iridocyclitis, conjunctivitis, keratitis and acute closure angle glaucoma.
4. Examination of patients.
5. Treatment of iridocyclitis.
6. Demonstration of patients.
7. Trans illumination.

PRACTICE 9 - 3 HOURS **TEST EXAMINATION. REVIEW.**

PRACTICE 10 - 3 HOURS

DISEASES OF THE LENS.

1. Trans illumination.
2. Examination of a patient with a cataract in one eye and transparent lens in the other eye by focal illumination, trans illumination and bio microscopy.
3. Examination of an aphakic patient.
4. Correction of aphakia.

5. Demonstration of patients, video film – cataract extraction.
6. Bio microscopy, trans illumination.

PRACTICE 11 - 3 HOURS

GLAUCOMA. DIAGNOSTICS, PERIMETRY, TREATMENT, PREVENTION.

1. Examination of the IOP:
 - a. by palpation
 - б. by the tonometer of Maklakov.
 - в. by the tonometer of Schiots and Goldmann.
2. Medical documentation of a glaucoma patient – changes of IOP during daytime, perimeters.
3. Demonstration of patients and differential diagnosis between open angle glaucoma and cataract.
4. Prevention of glaucoma and monitoring of glaucoma patients. .
5. Perimetry.
6. Treatment – medical, surgery, laser operations.
7. Demonstration of patients, video film – surgical treatment of glaucoma.

PRACTICE 12 - 3 HOURS

RETINAL DISEASES. RETINOPATHY OF PREMATURITY. RETINAL VASCULAR DISEASES. RETINAL DETACHMENT. MACULAR DEGENERATION. RETINAL TUMORS. OPTIC NERVE DISEASES.

1. Classification of the retinal diseases.
2. Retinal vascular diseases.
3. Retinal changes in systemic diseases.
4. Retinopathy of prematurity.
5. Retinal detachment.
6. Macular degeneration.
7. Malignant melanoma of the choroid – clinical picture, treatment.
8. Retinoblastoma – clinical picture, treatment.
9. Optic nerve head edema, optic neuritis, retrobulbar neuritis – ophthalmoscopy, clinical picture, treatment.
10. Anterior ischemic optic neuropathy.
11. Trans illumination.
12. Ophthalmoscopy.

PRACTICE 13 - 3 HOURS

TRAUMAS AND URGENCY IN OPHTHALMOLOGY.

1. What do we do when there is a trauma of the eye and the accessory structures of the eye.
2. Foreign bodies in the conjunctiva and the cornea.
3. Demonstration of patients with ocular traumas: blunt trauma, penetrating traumas of the eyeball.
4. First aid in ocular burns – thermal, chemical.
5. First aid in penetrating injuries of the eyeball.
6. First aid in acute closure angle glaucoma, occlusion of the central retinal artery or vein.
7. Demonstration of patients.

PRACTICE 14 - 3 HOURS

DISTURBANCE OF OCULAR MOTILITY. VISION IN CHILDHOOD.

- I. Disturbance of ocular motility.
 1. Subjective complaints.
 2. Objective findings in concomitant and paralytic strabismus.
 3. What should the general practitioner do?
- II. Congenital anomalies.
- III. Demonstration of patients.

PRACTICE 15 - 3 HOURS

INTRODUCTION. BLINDNESS

I.Problems of blindness.

1.Definition of blindness.

2.Most common diseases leading to blindness.

3.Types of blindness.

- absolute

- practical

- connected with work

- professional

- pedagogic

- monocular and binocular

- reversible and irreversible.

4.Problems of blindness.

- moral and ethical

- social

5.Rehabilitation of blind people.

Note: During practice including the anterior and posterior segment of the eye, patients are demonstrated and practical skills developed, depending on the theme of the practice.

PRACTICE COURSE

4 ears, VII (VIII) semester

№	Topic	Hours	Date
	ANATOMY OF THE EYEBALL. SYSTEMIC EXAMINATION OF PATIENTS WITH OCULAR DISEASE. FOCAL ILLUMINATION, EXAMINATION OF THE CONJUNCTIVA.	3 h	
	PATHOLOGY OF COLOR VISION AND LIGHT PERCEPTION, PERIPHERAL VISION	3 h	
	CENTRAL VISION. REFRACTION AND ANOMALIES OF REFRACTION. VISUAL ACUITY.	3 h	
	TRANS ILLUMINATION, OPHTHALMOSCOPY, SKIASCOPY	3 h	

	DISEASES OF THE ORBIT AND EYELIDS	3 h	
	DISEASES OF THE LACHRYMAL APPARATUS AND CONJUNCTIVA	3 h	
	DISEASES OF THE CORNEA	3 h	
	DISEASES OF THE UVEA	3 h	
	TEST EXAMINATION – REVIEW	3 h	
	DISEASES OF THE LENS	3 h	
	GLAUCOMA – DIAGNOSTICS, PERIMETRY, TREATMENT, PREVENTION	3 h	
	DISEASES OF THE RETINA. RETINOPATHY OF PREMATURITY. RETINAL VASCULAR DISEASE. RETINAL DETACHMENT. MACULAR DEGENERATION. RETINAL TUMORS. PATHOLOGY OF THE OPTIC NERVE	3 h	
	TRAUMAS AND OCULAR URGENCY	3 h	
	DISTURBANCE OF OCULAR MOTILITY. VISION IN CHILDHOOD	3 h	
	INTRODUCTION. BLINDNESS	3 h	

Total: 45 h.

BIBLIOGRAPHY

TEXTBOOK	AUTHORS	Publisher
Clinical Ophthalmology	Kanski J.	Butterworth Heinemann , UK, 1997
Diabetic Retinopathy.	Editor Mohammad Shamsul Ola.	InTech, Rijeka, Croatia, Feb. 2012.
Practical guide in ophthalmology	Editor: Prof. M. Konareva- Kostianeva	Medical University, Plovdiv, 2013
Ophthalmology	Gerhard K. Lang	Thieme, Stuttgart- New York, 2000

Basic and Clinical Science Course

Published by the American Academy of Ophthalmology, 12 sections

QUESTIONNAIRE FOR THE END EXAM IN OPHTHALMOLOGY MEDICAL STUDENTS

1. Eyeball – general information.
2. Anatomy of the outer layer of the eyeball / cornea, sclera /.
3. Anatomy of the middle layer of the eyeball / uvea /.
4. Anatomy of the retina.
5. Anatomy of the visual pathways.
6. Anatomy of the eyelids and conjunctiva.
7. Anatomy of lacrimal apparatus.
8. Anatomy of the orbit.
9. Anatomy of the muscular system of the eye - external muscles of the eye.
10. Light perception. Adaptation. Methods of examination. Disturbances of adaptation.
11. Colour vision. Theories and disturbances.
12. Central vision. Visual acuity. Examination of visual acuity. Visual charts.
13. Peripheral vision. Visual field. Methods for examination. Changes in visual field – scotomata, anopsias concentric narrowing.
14. Binocular vision. Fusion.
15. Diseases the orbit - general data. Inflammatory diseases of the orbit and soft tissues of the orbit.
16. Tumours of the orbit. Parasitic orbital diseases.
17. Inflammatory diseases of the skin and subcutaneous tissue of the eyelids. Diseases of the eyelid margins.
18. Tumours of the eyelids and conjunctiva.
19. Disturbances of eyelid mobility and position.
20. Inflammatory diseases of the conjunctiva – signs and symptoms
21. Conjunctivitis – types, signs, treatment.
22. Chronic conjunctivitis. Chlamydial conjunctivitis - paratrachoma and trachoma.
23. Allergic and autoimmune conjunctivitis. Vernal conjunctivitis. Lymphatic keratoconjunctivitis. Degenerations the conjunctiva - pinguecula and pterygium. Dry eye syndrome.
24. Diseases of the lacrimal drainage system.
25. Superficial non - purulent keratitis.
26. Superficial purulent keratitis.
27. Anomalies in size and curvature of the cornea. Keratoconus. Keratoplasty. Corneal refractive surgery.

28. Anterior uveitis / iridocyclitis / - clinical features, complications, differential diagnosis, treatment.
29. Posterior uveitis, chorioretinitis.
30. Inflammatory diseases of the whole uvea - tubercular, syphilitic, Toxoplasma, sarcoidosis. Ocular signs in AIDS.
31. Sympathetic ophthalmia. Endophthalmitis.
32. Malignant melanoma of the uvea.
33. Diabetic retinopathy and retinal changes in hypertension.
34. Acute retinal arterial and venous occlusive disease (branch and central retinal artery and vein occlusion).
35. Age – related macular degeneration (AMD). Retinitis pigmentosa. Central serous retinopathy.
36. Retinal detachment - congenital, primary, secondary.
37. Tumours of the retina / retinoblastoma /.
38. Retinopathy of prematurity (ROP).
39. Papilloedema. Inflammation of the optic nerve - papillitis, retrobulbar neuritis.
40. Ischaemic optic neuropathy. Optic atrophy - primary and secondary.
41. Pupil - general data. Normal reactions of the pupil. Abnormal reactions of the pupil.
42. Senile cataract, forms, stages, treatment. Aphakia.
43. Congenital cataracts. Changes of lens location - traumatic, congenital.
44. Primary open-angle glaucoma.
45. Angle closure glaucoma.
46. Congenital glaucoma. Secondary glaucomas - pigmentary, pseudoexfoliative, neovascular and traumatic.
47. Refraction of the eye. Physical optics. Eye as an optical system. Physical and clinical refraction. Examination of refraction - subjective and objective methods.
48. Accommodation - types, paralysis and spasm of accommodation. Presbyopia.
49. Hypermetropia, hyperopia.
50. Nearsightedness, myopia.
51. Astigmatism. Anisometropia. Eyeglasses - definition of spectacle lenses, magnifying glasses, telescopic spectacles. Contact lenses.
52. Eye motility disorders - general data. Amblyopia - types and treatment. Concomitant squint.
53. Paralytic squint.
54. Trauma the eyeball and its adnexa - general data. Classification. Injuries to the eye and its adnexa. Principles of treatment.
55. Penetrating injuries of the eyeball and adnexa with or without foreign body. Principles of treatment.
56. Eye burns - thermal, chemical. Radiation damage of the eyes. Principles of treatment.
57. Blindness - degrees, causes and types. The most common topical drugs in ophthalmology.
58. Emergency in ophthalmology: traumas, acute glaucoma attack, acute occlusion of retinal arteries and veins.

QUESTIONNAIRE FOR THE PRACTICAL EXAM IN OPHTHALMOLOGY MEDICAL STUDENTS

1. Exposing of the conjunctiva.
2. Massage of the lachrymal sac.
3. Shirmer test.
4. Fluorescein test.
5. Examination of the corneal sensitivity.
6. Biomicroscopy.
7. Illumination.

8. Ophthalmoscopy.
9. Examination of color vision.
10. Examination of visual acuity, perception and projection of light.
11. Control method of examination of visual field.
12. Palpation method of examination of the intraocular pressure.
13. Instillation of ocular medicaments (drops, crèmes).