FACULTY OF STOMATOLOGY

STUDY PROGRAM 0911.1 STOMATOLOGY

CHAIR OF OPHTHALMOLOGY

APPROVED
at the meeting of the Committee for Quality Assurance and Evaluation of the Curriculum Faculty of Stomatology
Minutes No. 3 of 13.02.2018

Committee President,
PhD, DMS, Associate professor,
Stepco Elena _____

APPROVED
at the Council meeting of the Faculty of Stomatology
Minutes No. 6 of 20.02.2018

Dean of Faculty of Stomatology
PhD, DHMS, Professor
Ciobanu Sergiu _____

APPROVED
at the meeting of the chair of ophthalmology
Minutes No. 7 of 02.03.2018
Head of chair PhD, professor
Bendelic Eugeniu _____

CURRICULUM

DISCIPLINE **OPHTHALMOLOGY**

Integrated studies

Type of course: **Compulsory discipline**

Chisinau, 2018

I. INTRODUCTION

Ophthalmology is a specialty, which deals with the detection, diagnosis, treatment and recovery of patients with diseases of eyeball and its accessory structures. Ophthalmology is an interdisciplinary, integrative clinical medical discipline, the study of which at the university level will allow the achievement of the necessary skills to support a correct diagnosis based on anamnesis, clinical and paraclinical examination, and the practical skills required to solve emergency ophthalmological cases, and choosing the right management.

Mission of the curriculum (aim) in professional training

One of the main objectives of the course is to acquire basic knowledge of notions in ophthalmological semiology and propedeutics. The second objective is to develop the professional capacities to provide emergency medical care in ophthalmology. At the level of understanding, an important objective is the interdisciplinary aspect within the specialties of ophthalmology - dentistry, the third objective providing the knowledge for recognition of odontogenic ocular pathologies and to apply the necessary diagnostic and management methods.

Language of the course: Romanian and English.

II. BENEFICIARIES: students of the III year, Faculty of Stomatology

III. MANAGEMENT OF THE DISCIPLINE

Code of discipline		**S.06.O.068**	
Name of the discipline		**Ophthalmology**	
Person(s) in charge of the discipline		**Professor Eugeniu Bendelic; associate professor Ala Paduca**	
Year	**III**	Semester/Semesters	**VI**
Total number of hours, including:			**60**
Lectures	**17**	Practical/laboratory hours	**17**
Seminars	**17**	Self-training	**9**
Form of assessment	**CD**	Number of credits	**2**

IV. TRAINING AIMS WITHIN THE DISCIPLINE

At the end of the discipline study the student will be able to:

✓ ***at the level of knowledge and understanding:***

- To identify anatomical and physiological features of the visual system;
- To know the particularities of the ophthalmic examination and the directions for their application;
- To know thoroughly the etiopathogenesis, clinical features, diagnosis, treatment principles and prevention of the most common ocular diseases; especially the odontogenic ocular diseases;
- To know the principles of first aid in emergency eye conditions.

✓ ***at the application level:***

- To take the anamnesis and evaluate the data about visual system functions;
- To recognize a possible odontogenic cause of ocular pathology and to apply the necessary diagnostic and management methods;
- To perform the basic ophthalmologic examination;

- To evaluate the results of clinical trials and tests, additional diagnostic investigations to appreciate the functional status of the visual system;
- To apply the methods of examination of emergency patient, evaluate these results and provide the necessary first aid.

✓ ***at the integration level:***

- To appreciate the importance of ophthalmology in the context of Medicine and integration with related medical disciplines;
- To appreciate the evolution of the physiological processes and etiology of the pathological processes of the visual system;
- To have skills to implement and integrate clinical knowledge;
- To be able to assimilate new achievements in clinical disciplines.

V. PROVISIONAL TERMS AND CONDITIONS

Student of the III year requires the following:

- knowledge of the language of education;
- competences in lyceum sciences (biology, physics) and thorough knowledge gained in fundamental disciplines such as: anatomy, physiology, biochemistry and others.
- digital competences (use of the Internet, processing of documents, electronic tables and presentations, use of graphics programs);
- ability to communicate and to work in a team;
- such qualities, as tolerance, compassion, autonomy.

VI. THEMESAND ESTIMATE ALLOCATION OF HOURS

No. d/o	THEME	Number of hours			
		Lectures	Seminars	Practical hours	Individual work
1.	**Ophthalmology.** Importance of ophthalmology. Interdisciplinary correlations dentistry - ophthalmology.	1	1	1	-
2.	**Anatomic and clinical features of the visual analyzer.** Three segments of the visual analyzer according to Pavlov. Particularities of the orbital structure and the orbital relation with the paranasal sinuses. Accessory structures of the eye: the eyelids, the lacrimal system and the conjunctiva: structure and functions. Coats of the eyeball: external (cornea and sclera), medium (uvea), internal (retina): structure and functions. Structure of the anterior chamber angle. Ways of production and evacuation of the aqueous humor. Content of the eyeball: the lens, the vitreous and the aqueous humor. Optical pathway of visual system. Oculo-motor system. Oculo-motor nerves.	1	1	1	0,5
3.	**Functions of the visual system, its possible disturbances and examination methods.** Function of rods and cones, the importance of vitamin A in the visual act. Photosensitivity, its disturbances and examination methods. Central vision, examination methods. Peripheral vision, major disturbances and examination methods. Chromatic sense: anomalies of the chromatic sense (congenital, acquired), examination methods.	1	1	1	0,5

4.	**Clinical refraction and accommodation of the eye.** Optical system of the eye. Clinical refraction and examination methods. Hypermetropia: classification, clinical manifestations, treatment. Myopia: classification, clinical manifestations, complications, treatment. Accommodation of the eye. Disorders of accommodation.	1	1	1	0,5
5.	**Binocular vision and its disturbances.** Neutralization, amblyopia. Examination methods for binocular vision. **Notions in strabismus** - classification, etiology, pathogenesis, clinical manifestations. Comitant strabismus vs. paretic strabismus. Methods of examination. The management of strabismus. Methods of prophylaxis.	1	1	1	0,5
6.	**Diseases of the eyelid, conjunctiva, and lacrimal system.** Blepharitis: etiology, clinical manifestations, treatment. Blepharospasm, ptosis, lagophthalmos: causes, treatment. Hordeolum (stye): clinical manifestations, treatment. Chalazion: etiology, clinical manifestations, treatment. Benign and malignant eyelid tumors: clinical manifestations, treatment. Dacryoadenitis: clinical manifestations, treatment. Acute and chronic dacryocystitis: clinical manifestations, treatment. Bacterial, viral and allergic conjunctivitis: clinical manifestations, treatment, prophylaxis.	1	1	1	0,5
7.	**Odontogenic oculo-orbital diseases.** Orbital cellulites.	1	1	1	1
8.	**Diseases of the cornea and sclera.** Classification of keratitis and etiological factors. Serpiginous corneal ulcer: clinical manifestations, treatment. Viral (herpetic) keratitis: clinical manifestations, treatment. Interstitial (syphilitic and tuberculous) keratitis: clinical manifestations, treatment. Keratoconus. Episcleritis and scleritis: etiology, clinical manifestations, treatment.	1	1	1	0,5
9.	**Congenital and acquired diseases of the lens.** Congenital cataract: etiologic factors, clinical manifestations, treatment. Acquired cataract, etiologic factors, clinical manifestations, treatment	1	1	1	0,5
10.	**Glaucoma.** Classification, pathogenesis and methods of diagnosis. Primary open-angle glaucoma: clinical manifestations, treatment. Acute glaucoma: clinical manifestations, differential diagnosis, treatment. Secondary glaucoma: etiology, clinical manifestations. Congenital glaucoma: clinical manifestations, treatment..	1	1	1	1
11.	**Diseases of the uvea.** Uveitis: classification, etiology. Iridocyclitis: clinical manifestations, treatment. Choroiditis: clinical manifestations, treatment.	1	1	1	1
12.	**Diseases of the retina and optic nerve**. Retinal vessel spasm, embolism (occlusion) and thrombosis, clinical manifestations, emergency medical care. Pathology of the eye in diabetes mellitus, hypertension and kidney diseases. Intraocular tumors: diagnosis, treatment. Retinal detachment:	1	1	1	0,5

	clinical manifestations, treatment. Optical neuritis (papillitis and retrobulbar neuritis). Papillary stasis, optic nerve atrophy, etiologic factors, clinical manifestations, treatment.				
13.	**Mechanical eye trauma.** Causes and forms of eye trauma. Clinical signs of orbital lesions, treatment. Eyelid, conjunctival lesions. Eye contusions: clinical manifestations, treatment. Ocular penetrating trauma: clinical manifestations, treatment. Sympathetic ophthalmia: etiology, clinical manifestations, treatment.	2	1	1	0,5
14.	**Ocular burns.** Ocular actinic burns: treatment, prophylaxis. Ocular chemical burns: clinical manifestations, treatment. Particularities of trauma in children and its prophylaxis.	1	1	1	0,5
15.	Occupational eye diseases (blepharitis, conjunctivitis, keratitis, cataracts): prophylaxis.	1	1	1	0,5
16.	Basic methods of examination in ophthalmology (biomicroscopy, ophthalmoscopy). Examination of practical skills.	1	1	1	0,5
17.	SUMMARY. COLOCVIUM.	-	1	1	-
TOTAL		**17**	**17**	**17**	**9**

VII. REFERENCE OBJECTIVES OF CONTENT UNITS

Objectives	Content units
Anatomic and clinical features of the visual analyzer. Functions of the visual system.	
• To define the notions in clinical semiology of the visual system. • To know the structure and functions of the eyeball andaccessory structures of the eye. • To demonstrate the examination of the accessory structures of the eye, the anterior pole of the eye (with diffuse light, focused light). • To apply the collection and interpretation of the ophthalmological anamnesis. • To determine the light perception and its disturbances; to determine visual acuity (VA) in adults and children • To possess skills for local administration of ophthalmic medicines. • To examine the visual field (comparative method, perimetery, campimetry), visual field disturbances: scotomas, hemianopsias, etc. and to interpret them • To determine the chromatic sense and detect dyschromatopsia.	Accessory structures of the eye: the eyelids, the lacrimal system and the conjunctiva: structure and functions. Coats of the eyeball: external (cornea and sclera), medium (uvea), internal (retina): structure and functions. Structure of the anterior chamber angle. Ways of production and evacuation of the aqueous humor. Content of the eyeball: the lens, the vitreous and the aqueous humor. Optical pathway of visual system. Oculo-motor system. Oculo-motor nerves. Function of rods and cones, the importance of vitamin A in the visual act. Photosensitivity, its disturbances and examination methods. Central vision, examination methods. Peripheral vision, major disturbances and examination methods. Chromatic sense: anomalies of the chromatic sense (congenital, acquired), examination methods.
Clinical optics (refraction) of the eye. Accommodation of the eye. Binocular vision and its disturbances. Notions in strabismus.	
• To know the basic symptoms of the ocular refraction errors	Clinical and physical refraction. Errors of ocular refraction - Myopia,

Objectives	Content units
• To detect refractive errors by the subjective method • To know the basic principles of management of ocular refractive errors • To know the mechanism of ocular accommodation and its disorders • To know the principle of optical management of presbyopia	Hypermetropia - symptomatology, management. Accommodation of the eye. Disorders of accommodation - presbyopia, spasm of accommodation, paralysis of accommodation
• To know the mechanism of binocular vision development, its importance • To know the basic methods of examination of binocular vision • To know the major binocular and monocular vision disorders. • To know the major types and forms of strabismus • To be able to distinguish a functional strabismus from a paralytic one • To know the basic principles of strabismus management	Binocular vision - development, examination. Disorders of binocular and monocular vision, neutralization and amblyopia - causes, management, prophylaxis. Notions in strabismus. Differential diagnosis of paralytic and functional strabismus. Management of patients with strabismus and prophylaxis.
Diseases of the eyelid, conjunctiva, and lacrimal system. Diseases of the cornea and sclera. Odontogenicoculo-orbital diseases	
• To perform eyelid eversion, examination of palpebral conjunctiva, inferior and superior conjunctival fornix and conjunctival layer of bulb • To define the symptoms of "dry eye" and "wet eye" • To differentiate the symptoms of bacterial conjunctivitis from viral and allergic conjunctivitis • To know the particularities of corneal disease symptoms (corneal syndrome) based on clinical cases • To examine corneal sensitivity with distinguishing of corneo-conjunctival lesions (fluorescein test). • To know oculo-orbital complications of odontogenic cause	Blepharitis. Blepharospasm, ptosis, lagophthalmost. Hordeolum. Chalazion. Benign and malignant eyelid tumors.Dacryoadenitis. Acute and chronic dacryocystitis. Bacterial, viral and allergic conjunctivitis. Pterygium. Diseases of the cornea and sclera. Serpiginous corneal ulcer. Viral (herpetic) keratitis. Interstitial (syphilitic and tuberculous) keratitis. Keratoconus. Episcleritis and scleritis. Odontogenic oculo-orbital diseases: Orbital cellulites.
Congenital and acquired diseases of the lens. Glaucoma.	
• To know the particularities of examining patients with lens diseases, based on clinical cases • To know general principles of cataract treatment and indications for surgical treatment • To integrate differentiation of primary open-angle and angle closure glaucoma symptoms • To know the general principles of examining intraocular pressure • To apply diagnostic methods to confirm or infirm glaucoma • To provide emergency medical care in acute glaucoma • To know the principles of complex glaucoma treatment	Congenial cataract. Acquired cataract. Glaucoma. Classification, pathogenesis and methods of diagnosis. Primary open-angle glaucoma. Acute glaucoma. Secondary glaucoma. Congenital glaucoma.

Objectives	Content units
Diseases of the uvea, retina and optic nerve.	
• To examine the pupil reflexes • To examine the uveal tract and the posterior pole: optic nerve, macular region, retinal vessels, retinal periphery (principles of ophthalmoscopy). • To know the particularities of the symptoms of inflammatory diseases at different levels of the uveal tract. • To integrate acute iridocyclitis management into differential diagnosis • To know the particularities of retinal disease symptomatology based on clinical cases • To apply central artery and vein occlusion management	Uveitis. Iridocyclitis. Choroiditis. Retinal vessel spasm, embolism (occlusion) and thrombosis. Pathology of the eye in diabetes mellitus, hypertension and kidney diseases. Intraocular tumors. Retinal detachment. Optical neuritis (papillitis and retrobulbar neuritis). Papillary stasis, optic nerve atrophy.
Eye trauma.	
• To provide urgent medical first aid inconjunctival and corneal foreign bodies • To apply monocular and binocular bandages • To know the particularities of the symptomatology and the primary management of penetrating ocular injuries • To know the methods of detection ofintraocular foreign bodies • To know the particularities of symptomatology and medical care in ocular contusion • To provide emergency medical care in ocular burns • To perform lavage of the conjunctival sac • To know the particularities of pediatric ocular trauma • To know the possible causes of the development of ocular occupational diseases and their type.	Eye trauma. Orbital traumatic lesions. Eyelid, conjunctival lesions. Eye contusion. Ocular penetrating trauma. Sympathetic ophthalmia. Ocular actinic burns. Ocular chemical burns. Particularities of trauma in children. Occupational eye diseases.

VIII. PROFESSIONAL (SPECIFIC (SC)) AND TRANSVERSAL (TC) COMPETENCES AND STUDY OUTCOMES

✓ **Professional competences (PC):**

- **PC1**: Knowledge, understanding and use of language specific to ophthalmology.
- **PC2**: To identify the anatomo-functional particularities of the visual analyzer.
- **PC3**: To establish the topic diagnosis based on defined clinical syndromes.
- **PC4:** To know etiopathogenesis, clinical manifestations, diagnosis, treatment principles in ophthalmological urgencies.
- **PC5:** Elaboration of the diagnostic plan, treatment in various pathological situations including the provision of ophthalmic emergency medical assistance.
- **PC6:** To recognize possible ophthalmic complications of odontogenic etiology.

✓ **Transversal competences (TC)**

- **TC1:** Applying professional standards of assessment, acting according to professional ethics, as well as the provisions of the legislation in force. Promoting logical reasoning, practical applicability, assessment and self-assessment in decision-making.

- **TC2:** Performing activities and exercising the roles specific to team work in various medical institutions. Promoting the spirit of initiative, dialogue, cooperation, positive attitude and respect for others, empathy, altruism and continuous improvement of their own activities;
- **TC3:** Systematically assessing personal skills, roles and expectations, applying self-assessments to processes of studying, acquired skills and professionalism needs, effective use of language skills, knowledge in information technologies, research and communication skills, to deliver quality services and adapting to the dynamics of policy requirements in health and for personal and professional development.

✓ **Study outcomes**

- To be able to implement the acquired knowledge in professional activity.
- To be competent to use critical and reliable scientific information obtained using the new information and communication technologies.
- To appreciate the importance of ophthalmology in the context of Medicine and integration with related medical disciplines.
- To supervise the pathological processes and to use the methods of investigation, treatment and prophylaxis of the emergency visual analyzer maladies and the ophthalmic disorders of odontogenic etiology.
- To have skills to implement and integrate clinical knowledge;
- To be able to assimilate new achievements in clinical disciplines.

IX. STUDENT'S SELF-TRAINING

No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Work with information sources	Mindful study of the lecture or the material in the manual on the theme. Reading the questions on the theme, which require a reflection on the subject. To get acquainted with the list of additional information sources on the topic. Select the source of additional information for that theme. Reading the text entirely, mindfully and writing the essential content. Formulating of generalizations and conclusions regarding the importance of the theme/subject.	Ability to extract the essentials; interpretative skills; volume of work	During the semester
2.	Work with activity book	To analyze the information and images on the respective subject in the lecture and handbook until solving the tasks in the notebook. Consecutive solving of tasks. Formulating conclusions at the end of each lesson. Verifing the	Volume of work, solving of the situational problems, ability to formulate conclusions	During the semester

		finalities of the respective lesson and appreciating of their achievement. Selection of additional information, using electronic addresses and additional bibliography.		
3.	Practice of different studying techniques		Volume of work, degree of understanding the essence of different topics, level of scientific argumentation, quality of conclusions, elements of creativity, demonstration of understanding the problem, formation of personal attitude	During the semester
4.	Work with online sources	Online self-evaluation, study of online materials from the chair site, expressing own opinions through forum and chat.	Number and duration of entries on the site, self-evaluation results	During the semester
5.	Elaboration and presenting of presentations/portfolios	Choosing of the research theme, establishment of the research plan, setting the terms of realization. Establishing PowerPoint project / theme components - theme, purpose, results, conclusions, practical applications, bibliography. Colleagues reviews. Teacher reviews.	Volume of work, degree of understanding the essence of the project theme, the level of scientific argumentation, the quality of conclusions, elements of creativity, formation of the personal attitude, coherence of the explanation and the scientific correctness, graphic presentation, way of presentation.	During the semester

X. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- ***Teaching methods used***

The teaching of the Ophthalmology discipline uses different ways and didactic methods, oriented towards the efficient acquisition and achievement of the objectives of the didactic process. In the theoretical lessons, along with traditional methods (lesson-exposure, lesson-conversation, synthesis lesson), modern methods (lesson-discussion, lesson-conference, problem-lesson) are also used. There are used individual, frontal, group activity formsand virtual lab works in the practical hours. In order to assimilate deeper the material, different semiotic systems (scientific language, graphical and computerized language) and teaching materials (tables, diagrams, micro photographies, posters) are used. During the lessons and extracurricular activities there are used Communication Technologies - PowerPoint presentations, online lessons.

- ***Recommended learning methods***
  - ✓ **Observation -** Identification of the elements characteristic for structures or biological phenomena, description of these elements or phenomena.
  - ✓ **Analysis -** Imaginary decomposition of the whole into component parts. Highlighting the essential elements. Studying each element as part of the whole.
  - ✓ **Scheme/figure analysis** - Selection of the necessary information. Recognition of structures shown in schemes and figures based on selected knowledge and information. Analysis of the functions/role of recognized structures.
  - ✓ **Comparison** - Analysis of the first object/process from a group and determination of its essential features. Analysis of the second object/process and determination of its essential features. Comparing objects/processes and highlighting common features. Comparing objects/processes and determining differences. Establishment of difference criteria. Formulation of conclusions.
  - ✓ **Classification** - Identification of the structures/processes that should be classified. Determining the criteria on which classification is should be made. Distribution of structures/processes by groups according to established criteria.
  - ✓ **Elaboration of the scheme** - Selection of elements, which must be included in the scheme. Interpretation of selected elements with different symbols/colors and indicating their relationships. Formulation of an appropriate title and legend of the symbols used.
  - ✓ **Modeling** - Identifying and selecting the elements needed to model the phenomenon. The imaging (graphical, schematic) of the studied phenomenon. Realizing the phenomenon using the developed model. Formulation of conclusions, deduced from arguments or findings.
  - ✓ **Experiment** - Formulation of a hypothesis, based on known facts, on the studied process/phenomenon. Verifying the hypothesis by performing the studied processes/phenomena in laboratory conditions. Formulation of conclusions, deduced from arguments or findings.

- ***Applied teaching strategies / technologies****(specific to the discipline)*

"Brainstorming" "Multi-voting"; "Round table"; "Group Interview"; "Clinical case study"; "Creative Controversy"; "Focus-group technique".

- ***Methods of assessment*** *(including the method of final mark calculation)*
  - ✓ ***Current***: frontal and/or individual control through
    - (a) applying docimological tests,
    - (b) analysis of case studies
    - (c) realization of role-plays on the topics discussed.
  - ✓ ***Final****:* Colloquium differentiated consisting of 3 stages:
    - Attestation of practical skills (practical test);
    - Theoretical exam: oral exam and written test (test).

Final: *3-step complex exam: test-control and oral interview according to tickets. The final mark - score is calculated on the basis of positive grades (≥5) of the annual average, calculated at the end of the discipline study - 30%; from test-control - 20%, practical skills - 20% and oral interview - 30%. The average annual mark and the marks of all final stages of testing (test and oral answer) - are expressed in numbers according to the scoring scale (according to the table) and the final mark obtained is expressed in two decimal digits, which is transferred to student's record-book.*

Method of mark rounding at different assessment stages

Intermediate marks scale (annual average, marks from the examination stages)	National Assessment System	ECTS Equivalent
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,0	**6**	
6,01-6,50	**6,5**	**D**
6,51-7,00	**7**	
7,01-7,50	**7,5**	**C**
7,51-8,00	**8**	
8,01-8,50	**8,5**	**B**
8,51-8,00	**9**	
9,01-9,50	**9,5**	**A**
9,51-10,0	**10**	

The average annual mark and the marks of all stages of final examination (computer assisted, test, oral) - are expressed in numbers according to the mark scale (according to the table), and the final mark obtained is expressed in number with two decimals, which is transferred to student's record-book.

Note: *Absence on examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to have two re-examinations.*

XI. RECOMMENDED LITERATURE:

A. Compulsory:

1. Lectures materials.
2. International Council of Ophthalmology Handbook for Medical Students Learning Ophthalmology [PDF]. ICO Handbook for Medical Students Learning Ophthalmology. www.icoph.org/downloads/icomedicalstudentenglish.pdf
3. Nicula, Cristina. Ophthalmology/C. Nicula; University of Medicine and Pharmacy "Iuliu Hatieganu", Cluj-Napoca. - Cluj-Napoca: Editura Medicală Universitară "Iuliu Haţieganu", 2011. - 136 p.. - ISBN 978-973-693-435-3.

B. Additional:

1. Practical Ophthalmology (PDF Download Available). https://www.researchgate.net/publication/316107859_Practical_Ophthalmology
2. Ophthalmology. A Short Textbook, New York, 2000, Gerhard K. Lang, M. D. 305 Illustrations. www.gulfkids.com/pdf/ATLAS%20-%20Ophthalmology.pdf
3. Kanski J. Clinical Ophthalmology a systematic approach. – Oxford, 2002.