Baba Farid University of Health Sciences

Ordinances & Syllabus

Bachelor of Optometry
(B. Optom.)

(4 Years Degree Programme including one year Internship)

(Applicable w.e.f. academic session 2019-20)

Faridkot -151203

Ordinances
Bachelor of Optometry
(B.Optom.)

1. Duration of course

Duration of course shall be four years including one year compulsory Internship

2. Admission criteria and qualifications:

The students shall be admitted as per the admission criteria and qualifications prescribed in the Notification issued by the Government of Punjab/Baba Farid University of Health Sciences, Faridkot, from time to time.

3. Medium of Instructions

The medium of instruction during the course and examinations shall be English.

4. Examination Schedule

4.1 The examination shall be held twice a year in the months of May/June and November/December or on such other dates as may be decided by the Board of Management on the recommendation of Faculty of Medical Sciences and Academic Council.

4.2 Normally, the University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than four and not more than six months between the two examinations.

4.3 Normally, the last dates for receipt of examination form and late fee in the University Office shall be as under:-

Examination Session	**Date for without late fee**	**Date with late fee of Rs.200/-**	**Date with late fee of Rs.500/-**	**Date with late fee of Rs.1500/-**
May/June	March 1	March 15	March 31	April 15
Nov./Dec.	Sept. 15	Sept. 30	Oct. 15	Oct. 31

4.4 In the case of late declaration of result due to any reason, the last dates for receipt of examination form and fee in the University Office shall be as under:-

Up to 15 days from the date of declaration of result	**Up to 30 days from the date of declaration of result**	**Up to 45 days from the date of declaration of result**	**Up to 60 days from the date of declaration of result**
Without Late Fee	With a late fee of Rs.200/-	With a late fee of Rs.500/-	With a late fee of Rs.1500/-

Note: 1. Examination Fee including cost of form should be submitted in the shape of Demand Draft in favour of "The Registrar, BFUHS" payable at Faridkot.

2. The Vice chancellor may permit acceptance of admission form and fee ten days before the commencement of examination with a late fee of Rs.5000/.

5. First Year B. Optometry Examination:

The First Year B. Optometry Examination shall be open to a person who

(a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.

(b) has his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% percent of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.

ii) of having of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.

iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 5 (a) & (b) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(c) The First Year B. Optometry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

(d) The First Year B. Optometry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Anatomy & Physiology	80	20	20	120	60	20	80	200
2.	Ocular Anatomy & Physiology	80	20	20	120	60	20	80	200
3.	Ocular Pathology & Microbiology	80	20	20	120	60	20	80	200
4.	Orthoptics	80	20	20	120	60	20	80	200
5.	English*	80	20	-	100	-	-	-	100

*Note: The Examination in the subject of English will be conducted at College level and minimum pass marks shall be 35% and marks will be sent to the University for final inclusion in the result.

6. Second Year B. Optometry Examination:

The Second Year B. Optometry Exam shall be open to a person who

(a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.

(b) has passed the First Year B. Optometry examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University at least six months before the final examination of Second Year B. Optometry examination.

(c) has his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.

ii) of having of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.

iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 6 (a), (b) & (c) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(d) The Second Year B. Optometry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

(e) The Second Year B. Optometry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Pharmacology & Pharmacy	80	20	20	120	60	20	80	200
2.	Optics	80	20	20	120	60	20	80	200
3.	Orthoptics	80	20	20	120	60	20	80	200
4.	Ophthalmic instruments and appliances	80	20	20	120	60	20	80	200

7. Third Year B. Optometry Examination:

The Third Year B. Optometry Examination shall be open to a person who

(a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.

(b) has passed the Second Year B. Optometry examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University at least six months before the final examination of Third Year B. Optometry examination.

(c) his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.

ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.

iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 7 (a), (b) & (c) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(d) The Third Year B. Optometry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

(e) The Third Year B. Optometry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Clinical & advanced Optics & Orthoptics	80	20	20	120	60	20	80	200
2.	Clinical Refraction and Contact Lenses	80	20	20	120	60	20	80	200
3.	Community Ophthalmology and Eye Bank	80	20	20	120	60	20	80	200
4.	Investigations in Clinical Ophthalmology and Management of O.T .	80	20	20	120	60	20	80	200

8. Internal Assessment

i) Internal Assessment shall be submitted to the University at least two weeks before the commencement of theory examinations or within one week from the issuance of Roll Numbers by the University. All the colleges shall adopt uniform criteria for Internal Assessment as follows:-

a) Attendance above 90% to be acknowledged with 10% extra weight-age for Internal Assessment.

b) At least two tests to be held in each year in addition to the pre-final (send up) examination. The Internal Assessment should be the average of all awards of these tests taken together.

c) Criteria for calculation of Internal Assessment

i)	House Examinations	- 80%
ii)	Attendance (above 90%)	- 10%
iii)	Subject assessment (candidate's conduct and extra curricular participation)	- 10%

d) Additional mandatory requirement for Internal Assessment to be observed by all colleges.

i) All test marks obtained by candidates will be displayed on Notice Boards of respective departments as and when they are awarded.

ii) All computations of Internal Assessment of the entire class made by the HOD of the department shall be displayed on the notice board of the department showing individual test marks, advantage of all tests, attendance advantage and subjective assessment and the total Internal Assessment thus derived for at least one week before sending the awards to the Principal's office.

iii) Professor Incharge/HOD preparing Internal Assessment shall certify that the detailed assessment of the entire class has been displayed on the department Notice Board for at least one week prior to its being submitted for onward transmission to the University and that adequate opportunity has been given to all the students to file any objections and that the same have been addressed satisfactory.

iv) The Principal forwarding the Internal Assessment to the University shall countersign the above referred certificate of the HOD/Professor In-charge preparing the Internal Assessment.

e) The re-appear/fail students may be re-assessed for improvement in the Internal Assessment and awards of Internal Assessment of all the re-appear/fail students will be submitted to the University every time.

9. **Promotion and number of attempts allowed**

a) A candidate who fails in all the subjects in the First Year B. Optometry examination shall not be promoted to Second Year class.

b) The candidate who will absent himself/herself from the examination will be deemed to have been failed in that subject.

c) A candidate who passes in at least one subject of University level First Year B. Optometry examination will be permitted to attend classes of Second Year. However, he/she will be allowed to appear in the Second Year B. Optometry examination only after passing all the subjects of First Year B. Optometry Examination.

d) Candidate who passes in one or more subjects of First Year B. Optometry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), failing which he/ she shall not be allowed to continue his studies.

e) A candidate who fails in all the subjects in the Second Year B. Optometry examination shall not be promoted to Third Year class.

f) A candidate who passes in at least one subject of University level Second Year B. Optometry examination will be permitted to attend classes of Third Year. However, he/she will be allowed to appear in the Third Year B. Optometry examination only after passing all the subjects of Second Year B. Optometry Examination.

g) Candidate who passes in one or more subjects of Second Year B. Optometry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts including first attempt, as a regular candidate plus one mercy chance at the discretion of the Vice-Chancellor, failing which he/ she will have to appear in all the subjects of the examination.

h) Candidate who passes in one or more subjects of Third Year B. Optometry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), failing which he/ she will have to appear in all the subjects.

10. Appointment of Examiners:

The examiners shall be appointed by the University on the recommendations of the Board of Studies in Medical Sciences (Undergraduates)/Faculty of Medical Sciences.

i) There shall be four examiners – two internal and two external.

ii) Professor& Head of the Department shall be the Convener. The second Internal Examiner will be appointed by annual rotation from amongst the Professors/Associate Professors/Assistant Professor with at least 3 years post PG teaching experience. In case of non-availability of Professors/Associate Professors/Assistant Professor in the department the teacher working in another Medical College affiliated to this University, who fulfils the minimum requirements as per MCI norms for appointment as examiner may be appointed as Internal Examiner.

iii) The examiners shall be appointed by the University from the teachers working in the Medical Colleges affiliated to it, preferably from the colleges where this course is being run, on the recommendations of the Board of Studies in Medical Sciences and Faculty of Medical Sciences.

iv) In case of non-availability of External Examiners from amongst the affiliated colleges of BFUHS, External Examiners may be appointed from the colleges which are not affiliated to BFUHS, Faridkot, in and outside the State of Punjab.

11. Paper setting and moderation of Question Papers

Each theory paper shall be of three hours duration. The paper setting and moderation of Question Papers will be got done under the direction of the Vice-Chancellor, if necessary.

The question paper covering the entire course shall be divided into two sections.

Section A:

Question 1: This will consist of five short answer questions with answer to each question up to 250 words in length. All questions will be compulsory. Each question will carry 5 marks total weight-age being 25 marks.

Question 2: This will consist of two long answer questions with answer to each question up to 1000 words in length. Two questions will be set by the examiner and the candidate will be required to attempt one. Each question will carry 15 marks.

Section B

Question 1: This will consist of five short answer questions with answer to each question up to 250 words in length. All questions will be compulsory. Each question will carry 5 marks total weight-age being 25 marks.

Question 2: This will consist of two long answer questions with answer to each question up to 1000 words in length. Two questions will be set by the examiner and the candidate will be required to attempt one. Each question will carry 15 marks.

12. Evaluation of Answer Books

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (table marking) or any other method under the direction of the Vice-Chancellor.

13. Minimum pass marks:

The minimum number of marks to pass the examination shall be 50% in theory including Internal Assessment & Oral/Viva and 50% in practical including Internal Assessment in each subject separately except in the subject of English where minimum pass marks shall be 35%.

A successful candidate on the basis of theory and practical marks taken together shall be classified as under: -

Second Class : A candidate obtaining 50% or more marks but less than 60% marks
First Class : A candidate obtaining 60% or more marks
First Class with Distinction : A candidate obtaining 80% or more marks

14. Grace Marks:

That the grace marks up to 5 (five) be given to the best advantage of the students irrespective of Theory or Practical examinations.

15. Declaration of Result

The Registrar/Controller of Examinations shall publish the result after the examination. The candidates shall be issued Detailed Marks Certificate through their Principals.

16. Compulsory Internship

The candidate will be allowed to join one year Compulsory Internship only after passing the Third Year B. Optometry Examination.

16. Award of Degree

On successfully completion of one year compulsory rotatory internship, duly certified by the Principal of the College, the students shall be awarded the Degree of Bachelor of Optometry.

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SYLLABUS

Bachelor of Optometry

MAIN OBJECTIVE OF THE COURSE

Basic Medical Sciences

1. To achieve general understanding of the human Biology (Anatomy, Physiology and Biochemistry).
2. To achieve good understanding of the basic medical sciences as related to Ophthalmology (Anatomy, Physiology, Optics, Pharmacology and Microbiology).

Clinical

The objective of the clinical work are to enable a student to work under the supervision of an Ophthalmologist so as to render assistance, develop skills and to perform other optometric jobs.

1. Be able to develop skills to carryout Ophthalmic Investigations.
2. Be able to do refraction work including prescription of glasses, contact lenses, low vision aids.
3. Be able to assess disorder of Ocular motility and uniocular and binocular visual functions and knowledge of principles of non-surgical therapy and indications of surgery.
4. To impart knowledge with regard to common eye diseases with a view to acquaint them in their recognition.
5. To impart training to develop skill in manufacturing of spectacle lenses and contact lenses.
6. To impart knowledge regarding organizations of eye banks and preservation of ocular tissues.
7. To impart knowledge regarding importance and the methodology of conducting surveys for early detection of visual defects, prevalence of ocular diseases and organization of community services like eye camps, schools, clinics and community eye care programme.
8. To impart knowledge regarding the programme of blindness, its causes and principles of rehabilitation of the blind.

COURSE STRUCTURE

This course shall be for a period of three academic years and commencing from Ist August. There is no session vacation.

The admission for this course shall be:

1. Candidates who have secured at least 50% of marks or Grade-III in class 12 or equivalent examination in science. Subjects (Physics, Chemistry, Biology & Mathematics).
2. Admission shall be held in July each year.

Academic Time

Monday to Friday- 9:00 AM to 4:30 PM
Saturday- 9:00 AM to 1:00 PM

Sunday- holiday

Academic time is devoted to
1. Theory classes
2. Lecture demonstrations
3. Seminars/Group discussion
4. Practical works in OPD (out patient department), various laboratories, clinics, and ophthalmic investigative labs, and community work.

FIRST YEAR

Thirty-six theory lectures per month (each one hour) and two seminars in a month (each two hours)
Total theory time per month: 10 hrs/week
Practical postings: 26 hrs/week
Total academic time per month: **36 hrs/week**

Note: Paper – IV "Ocular Anatomy & Physiology" will be taught by the department of Ophthalmology.

SECOND YEAR

Thirty-six theory lectures per month (each one hour) and two seminars in a month (each two hours)
Total theory time per month: 10 hrs/week
Practical postings: 26 hrs/week
Total academic time per month: **36 hrs/week**

THIRD YEAR

Eighteen theory lectures per month (each one and half hour) and two seminars in a month (each two hours)
Total theory time per month: 8 hrs/week, Practical postings: 28 hrs/week
Total academic time per month: **36 hrs/week**

GENERAL LECTURES FOR ALL STUDENTS ($1^{ST,}$ 2^{ND} & 3^{RD} YEAR)

1. Hospital environment and role of student.
2. The profession and Ethics.
3. Communications with the patients.
4. Statistics and its importance.
5. Social welfare of eye patients.
6. Law and the Optometry.

SYLLABUS – FIRST YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – I

ANATOMY & PHYSIOLOGY

Theory: 70 Hours
Practical: 20 Hours

SECTION 'A' – ANTOMY

1. **Introduction:**

- Definition of anatomy and its divisions, Terms of location, positions and planes.
- Cell and its organelles, Tissues & its classification, Glands.

2. **Musculoskeletal system:**

- Structure of Bone & its types.
- Joints- Classification of joints with examples; details of synovial joint.
- Bones & joints of upper limb, lower limb and their movements.
- Axial skeleton & appendicular skeleton.
- Skull, spine & its movements, intervertebral disc.
- Muscles & its types.
- Muscles of the upper limb, lower limb, trunk and neck.

3. **Cardiovascular System:**

- Arteries & veins, Capillaries & arterioles.
- Heart- size, location, chambers, blood supply of heart, pericardium.
- Systemic & pulmonary circulation.
- Major blood vessels of Heart- Aorta, pulmonary artery, common carotid artery, subclavian artery, axillary artery, brachial artery, common iliac artery, femoral artery.
- Inferior vena cava, portal circulation, great saphenous vein.

4. **Lymphatic System:**

- Lymph & Lymph vessels.
- Structure of lymph node, names of regional lymphatics, axillary and inguinal lymph nodes.

5. **Gastro-intestinal System:**

- Parts of GIT, structure of tongue, pharynx, salivary glands.
- Location & Gross structure of Oesophagus, stomach, intestine (small and large), liver, gall bladder, pancreas, spleen.

6. **Respiratory system:**

- Parts of Respiratory system; Structure of nose, nasal cavity, larynx, trachea, lungs, pleura, bronchopulmonary segments.

7. Urinary System:

- Parts of Urinary system, location and gross structure of kidney, ureter, urinary bladder, urethra.

8. Reproductive system:

- Parts of male reproductive system, gross structure of testis, vas deferens, epididymis, prostate.
- Parts of female reproductive system, gross structure of uterus, ovary, fallopian tube, mammary gland.

9. Endocrine glands:

- Name of all endocrine glands, gross structure & functions of pituitary gland, adrenal gland, thyroid gland and parathyroid gland.

10. Nervous system:

- Neuron, classification of NS.
- Meninges, ventricles, CSF.
- Gross features of cerebrum, midbrain, pons, medulla oblongata, cerebellum, name of basal nuclei.
- Blood supply of brain, cranial nerves.
- Spinal cord and spinal nerves.
- Autonomic nervous system.
- Auditory pathways

11. Sensory Organs:

- Skin & its appendages.
- Structure of ear: external, middle & inner ear.

Practical:

Demonstration of all bones of the human body.
Demonstration of all organs of the human body.

Histology:

- Epithelium: Simple (squamous, cuboidal, columnar, ciliated), Stratified, Transitional
- Bone, muscles (skeletal, smooth, cardiac)
- Cartilage (hyaline, elastic, fibro cartilage).
- Connective Tissue (loose and dense).
- Arteries (large & medium sized), Veins.

Reference Books

1. Ross and Wilson, Anatomy and Physiology, Chruchill Livingstone.
2. Companion Pocketbook for quick review
3. B.D. Chaurasia's Human Anatomy -Vol. (1,2,3)
4. Anatomy for B.Sc. Nursing – Dr Renu Chauhan

SECTION 'B' – PHYSIOLOGY

1. **Blood**
   - Red Blood Cells- Functions, count, Physiological variations. Erythropoisis-stages
   - Hemoglobin-Functions, Physiological variations.
   - White Blood cells-Functions, count, morphology.
   - Platelets-count, morphology, functions. Hemostasis-Definition, Mechanism, clotting factors.
   - Blood groups-ABO system, Rh system, Blood transfusion- Indication, transfusion reactions.
   - Anaemias-classification, morphological and Etiological, effects of anaemia on body.

2. **Cardiovascular System**
   - Heart-Physiological Anatomy, Nerve supply, Properties of cardiac muscle.
   - Cardiac Cycle-Events –systole, diastole
   - Cardiac Output-Definition and factors affecting it.
   - Heart sounds-normal heart sounds, its causes, areas of auscultations.
   - Blood Pressure-Definition, normal value, Physiological variations, its measurement.
   - ECG- normal waves.
   - Shock-Definition, Types.

3. **Gastrointestinal System**
   - Physiological Anatomy, functions of GIT.
   - Salivary Gland-functions of saliva.
   - Stomach- structure and functions, Gastric secretions-composition, functions, Mechanism
   - Pancreas- structure, functions, composition of Pancreatic juice.
   - Liver-Functions of liver.
   - Bile-Composition, functions.
   - Jaundice-Types and its causes.
   - Gall Bladder- Functions
   - Intestine- Movements of small and large intestine.
   - Digestion and Absorption of Carbohydrates, Protiens, Fats.
   - Hormones of GIT- Functions of Gastrin, Secretin, CCK-Pz.

4. **Respiratory System**
   - Physiological Anatomy, Functions of the respiratory system.
   - Types of respiration, respiratory membrane.
   - Lung volumes and capacities, vital capacity and factors affecting it.
   - Transport of Oxygen-Forms of transportation, Oxy-hemoglobin dissociation curve and factors affecting it.
   - Transport of Carbon-Dioxide- Forms of transportation.
   - Hypoxia-Definition, types, effects of hypoxia.
   - Cyanosis-Definition and types.
   - Artificial Respiration- CPR

5. **Endocrine System**
   - Classification of Endocrine glands and their hormones.
   - Thyroid Gland-Physiological Anatomy, hormones secreted, functions, disorders-Hypo and hyper secretion of hormone.
   - Adrenal Gland-Adrenal Cortex-Physiological Anatomy, its hormones and functions.

- Adrenal Medulla-Hormones, functions.
- Pituitary Gland- Anterior and posterior pituitary hormones and their functions, disorders.
- Pancreas- Hormones and their functions, Diabetes Mellitus-types, pathophysiology, signs and symptoms.
- Parathyroid Gland- Hormones and their functions.

6. Central Nervous System

- Structure of neuron, functions of nervous system.
- Classification and properties of nerve fibres
- Synapse- structure and types
- Receptors-Definition, classification, properties, Reflex Arc
- Ascending and Descending tracts- names and functions
- Functions of Hypothalamus
- Functions of Cerebellum and Basal Ganglia
- Functions of Cerebral Cortex
- **Autonomic Nervous System-** Actions of sympathetic and parasympathetic system and their comparison.
- **Special Senses-** Ear-structure, functions, General mechanism of hearing

7. Excretory System

- Kidneys-structure of nephron, functions of kidney
- Glomerular filtration Rate(GFR) and factors affecting it
- Counter Current Mechanism
- Bladder-its innervation, micturition reflex

8. Reproductive System

- Male Reproductive System-Stages of spermatogenesis, function of Testosterone
- Female Reproductive System-Ovulation, menstrual cycle, functions of Estrogen and progesterone

9. Nerve Muscle Physiology

- Classification of Muscle, structure of skeletal muscle
- Neuromuscular Junction
- Excitation Contraction Coupling

Practical:

- Estimation of Hemoglobin Concentration
- Determination of Bleeding Time and Clotting Time
- Determination of Blood Groups
- Recording of normal Blood Pressure
- Clinical Examination of Arterial Pulse
- Determination of Vital Capacity

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SYLLABUS – FIRST YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – II

OCULAR ANATOMY & PHYSIOLOGY

THEORY

A. OCULAR ANATOMY

1. Embryology of the eye in general
2. Orbit and its immediate relations
3. Lids and eye lid glands
4. Conjunctiva, Cornea and Sclera
5. Iris and Cilliary body
6. Lens and Vitreous
7. Retina & Choroid
8. Ocular Muscles
9. Visual pathways
10. Sympathetics and parasympathetics system
11. Vascular supply of eye
12. Lacrimal apparatus
13. Aqueous humor
14. Vitreous humor

B. OCULAR PHYSIOLOGY

1. General physiology of the eye- An introduction
2. Visual acuity and form sense
3. Pupillary reflexes
4. Accommodation
5. Convergence
6. Intra Ocular Pressure
7. Night Vision
8. Colour Vision
9. Visual Fields
10. Extrinsic Muscles, Action and Ocular Movements
11. Electrophysiological Aspects
12. Conjugate and Disguate- Movements of the eye
13. Metabolism and Transparency of lens and cornea
14. Rhodopsin Cycle
15. Tear film and pH

Practical

1. Orbit and its applied Anatomy
2. Lids and eye lid glands – Applied Anatomy
3. Conjunctiva, Cornea and Sclera – Applied Anatomy
4. Iris and Cilliary body – Applied Anatomy
5. Lens and Vitreous – Applied Anatomy
6. Retina & Choroid – Applied Anatomy

7. Applied anatomy of extra Ocular Muscles
8. Visual pathways & its signifigance
9. Lacrimal apparatus
10. Aqueous humor
11. Pupillary reflexes

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SYLLABUS – FIRST YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – III
OCULAR PATHOLOGY & MICROBIOLOGY

THEORY

A. OCUALR PATHOLOGY

1. HAEMATOLOGY

1.1 Blood Cells and blood collection techniques
1.2 Haemoglobin estimation
1.3 Total leucocyte count
1.4 Differential leucocyte count
1.5 Erythrocyte sedimentation rate
1.6 Pheripheral blood film- staining, significance of a peripheral smear
1.7 Bleeding time, clotting time

2. CLINICAL PATHOLOGY

2.1 Urine Collection methods
2.2 Physical Examination of Urine
2.3 Chemical Examination of Urine
2.4 Microscopic Examination of Urine

3. HISTOPATHOLOGY

3.1 Grossing of tissue
3.2 Tissue processing
3.3 Fixation of tissue
3.4 Section cutting
3.5 Staining- Hematoxylin & Cosin and special Stains

B. OCULAR MICROBIOLOGY

1. Introduction to Microbiology & classification
2. Gram positive Bacteria
3. Gram Negative Bacteria
4. Fungi- sephorophytics and pathogenic
5. Virus
6. Aseptic techniques
7. Chlayadia & parasites

PRACTICAL

A. OCULAR PATHOLOGY

1. Sampling and Collection of Blood: intro-venous and peripheral
2. Estimation of haemoglobin
3. Peripheral Blood Film Staining
4. Identification of normal white blood cells
5. Erythrocyte sedimentation rate
6. Urine chemical examination- Blood Sugar and Protein
7. Hematoxylin and Cosin Staining

B. OCULAR MICROBIOLOGY

1. Introduction to Microbiology: Culture media, Classification, Morphological, Lab. diagnosis of infection
2. Collection of samples
3. Serology
4. Culture media for bacteria, fungi and viruses
5. Oxidase test
6. Mantoux test
7. Staining procedures: Gram Staining
8. Staining procedures: Romanowsky stains
9. Staining procedures: Ziehl Neelsen's staining

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SYLLABUS – FIRST YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – IV
REFRACTION & ORTHOPTICS

THEORY

1. Emmetropia & Ammetropia- Aetiology, Population, Distribution, Growth of eye
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo- phakia
6. Presbyopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular reflex
10. Accommodation & Convergence-1, Far point, near point, range, amplitude of accommodation
11. Accommodation & Convergence-2, Methods of measurements, NPA. AC/A ratio.
12. Retinoscopy- Principle & Methods
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16. Tests for Potential Vision

PRACTICAL

1. Refraction and prescription of glasses in OPD.
2. Latent squint work-up
3. Synptophore
4. Maddox wing
5. Maddox rods
6. Prism bar
7. Near point of accommodation
8. Near point of convergence
9. Fusion exercises

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SYLLABUS – FIRST YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – V

ENGLISH

Theory : 35 hours

Communication:-

Role of communication Defining Communication Classification of communication Purpose of communication
Major difficulties in communication Barriers to communication
Characteristics of successful communication – The seven Cs Communication at the work place
Human needs and communication "Mind mapping" Information communication

Comprehension passage:-

Reading purposefully
Understanding what is read
Drawing conclusion
Finding and analysis

Explaining:-

How to explain clearly
Defining and giving reasons
Explaining differences
Explaining procedures
Giving directions

Writing business letters:-

How to construct correctly
Formal language
Address
Salutation
Body
Conclusion

Report writing:-

Reporting an accident
Reporting what happened at a session
Reporting what happened at a meeting

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SYLLABUS – SECOND YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – I

OCULAR PHARMACY AND PHARMACOLOGY

THEORY

1. Ocular Pharmacology- An introduction
2. Autonomic nervous system
3. Routes of drug administration
4. Miotics, Mydriatics & Cycloplegics drugs
5. Antibacterial drugs & therapy
6. Antifungal drugs & therapy
7. Anti- Viral drugs & therapy
8. Anti-inflammatory drugs & therapy
9. Anti- glaucoma drugs & therapy
10. Ophthalmic dyes
11. Local Anaesthetics
12. Ophthalmic preservatives
13. Ocular lubricants
14. Ocular irrigating solutions
15. Ocular antiseptics & disinfectants
16. Anti-cataract agents
17. Contact lens solution
18. Chelating agents
19. Immunosuppressive agents

PRACTICAL

1. Quality Control:

    1.1. Sterilization
    1.2. pH measurement
    1.3. Osmolarity
    1.4. Spectrophotometry for concentration

2. How to prepare following eye drops:

    2.1 Pilo-clonidine eye drops
    2.2 Artificial eye drops
    2.3 Glycerin eye drops
    2.4 Homatropine eye drops
    2.5 EDTA eye drops
    2.6 Sulphacetamide eye drops
    2.7 Dexamethasone eye drops
    2.8 Methylecellulose eye drops
    2.9 Saline eye drops
    2.10 Sodium citrate eye drops

3. MK Media preparation
4. Fluorescein Strip, Rose Bengal Strips Preparation
5. Autologous serum eye drops preparation
6. Dilution of drug in different concentration
7. Steroid detection test

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SYLLABUS – SECOND YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – II

OPTICS

THEORY

1. Elementary basis of light- Interference, diffraction, polarization spectrum, surface tension, viscosity.
2. Principles of Refraction
3. Physical Optics-1, Lens Shapes- Convex, Concave
4. Physical Optics-2, Thin Lens equation, thick lens equation
5. Physical Optics-3, Front and back vertex power
6. Physical Optics-4, Aberrations
7. Physical Optics-5, Spherical, Cylindrical & Toric surfaces, Aspheric surfaces
8. Prisms- definition, uses, nomenclature, apex
9. Determination of focal length & diopteric power of lens
10. Strum's Conoid
11. Neutralization of lenses
12. Focimeter
13. Centre & Axis Marking by focimeter
14. Simple & Toric transposition
15. Prismatic effect & Decentration
16. Aberrations & Tints in spectacle Lenses
17. Spectacle Lens Manufacturing- Sphericals, Toric, Bifocals, Lenticular & Lab Visit
18. Spectacle Frames- History, Nomenclature, Types & parts, sides, joints, frame bridge
19. Shape of Spectacle Frame- Measurements & Making, Frame & Face Measurements
20. Schematic eye
21. Emmetropia & Ammetropia- Aetiology, Population, Distribution, Growth of eye
22. Myopia
23. Hypermetropia
24. Astigmatism
25. Aphakia/Pseudo- phakia
26. Presbyopia
27. Keratoconus
28. Post-Op. Refractive errors
29. Refraction of irregular reflex
30. Accommodation & Convergence-1, Far point, near point, range, amplitude of accommodation
31. Accommodation & Convergence-2, Methods of measurements, NPA. AC/A ratio.
32. Retinoscopy- Principle & Methods
33. Objective Refraction
34. Subjective Refraction
35. Cross Cylinder
36. Manufacturing Spectacle Lens
37. Plastic Lenses- Manufacturing & Characteristic
38. Lens Designs-Ashperic
39. High Index Lenses

40. Photocromatic Lenses
41. Tinted Lenses
42. Polaroid Lenses
43. Bifocals
44. Measurement for ordering spectacle, IPD, Marking centration. V.D.Calculation.
45. Fitting Bifocals, Multifocals, Prism Lenses
46. Fitting Lenses in Frames
47. Glazing & Edging
48. Patient complains, handling correction
49. Repair of spectacles
50. Test chart standards
51. Phoropter
52. Objective Optometer
53. Projection Charts
54. Refraction room Standards

PRACTICAL

1. Manufacturing Spectacle Lens
2. Manufacturing Bifocal Lenses
3. Measurement for ordering spectacle, IPD, Marking centration, V.D. Calculation
4. Fitting Bifocals, Multifocals, Prism Lenses
5. Fitting Lenses in Frames
6. Glazing & Edging
7. Patient complains, handling correction
8. Repair of spectacles
9. Neutralization of lenses
10. Focimeter
11. Shape of Spectacle Frame- Measurement & Making, Frame & Face Measurements
12. Refraction under the supervision

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SYLLABUS – SECOND YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – III

ORTHOPTICS

THEORY

1. Orthoptics- General Concept
2. Ocular muscles and movements
3. AC/ A ratio
4. Measurements of angle of squint
5. Latent squint
6. Maddox rod
7. Maddox wing
8. Manifest concomitant
9. Squint concomitant
10. Paralytic squint
11. Head posture and its significance
12. Hess screening and its interpretations
13. Pleoptics
14. Occulsion- types and uses
15. Amblyopia
16. Disorders of accommodation
17. Paediatric visual acuity assessment
18. Paediatric Refraction

PRACTICAL

1. Manifest squint work-up
2. Paralytic squint work-up
3. Pleoptics
4. Orthoptic Exercises

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SYLLABUS – SECOND YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – IV
OPHTHALMIC INSTRUMENTS AND APPLIANCES

THEORY

1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope
3. Slit Lamp: Haag- Streit
4. Photo- slit lamp
5. Lensometer. Lens gauge
6. Tonometer
7. Fundus Camera
8. External eye photography
9. Auto- refractometer
10. Corneal Examination-1. Placido disc
11. Corneal Examination-2. Keterometer
12. Corneal Examination-3. VKG
13. Corneal Examination-4. Specular Microscopy
14. Corneal Examination-5. Aesthesiometer
15. Exophthalmometer
16. Perimeter-Manual & automated
17. Heidelberg Retino-tomography HRT-II
18. Nerve fibre analyzer
19. Frequency doubling perimeter
20. Non Contact Tonometer
21. Pachometers
22. Contrast sensitivity tests
23. Colour vision tests

PRACTICAL

1. Lensometer, Lense gauge
2. Tonometer
3. Placido disc
4. Keterometer
5. VKG
6. Specular Microscopy
7. Exophthalmometer
8. Petimeter
9. Non Contact Tonometer
10. Slit Lmap: Haag-Streit
11. Photo- Slit lamp
12. Funds Camera
13. Contrast sensitivity test
14. Glare acuity tests
15. Colour vision tests
16. Dark adaptometer

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SYLLABUS – THIRD YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – I
CLINICAL & ADVANCED OPTICS & ORTHOPTICS

THEORY

A. CLINICAL AND ADVANCED OPTICS

1. Emmetropia & Ammetropia- Aetiology, Population, Distribution, Growth of eye.
2. Aphakia/Pseudo-phakia
3. Presbiopia
4. Keratoconus
5. Post-Op. Refractive errors
6. Refraction of irregular re/ex
7. Accommodation & Convergence-1. Far point, near point, range, amplitude of accommodation
8. Accommodation & Convergence-2. Methods of measurements, NPA. AC IA ratio.
9. Retinoscopy-Principal & Methods
10. Objective Refraction
11. Subjective Refraction
12. Cross Cylinder
13. Binocular Optical effects
14. Asthenopia

B. ORTHOPTIC

1. Orthoptic-General concept
2. Ocular muscles and movements
3. Measurements of angle of squint
4. Latent squint
5. Maddox rod
6. Maddox wing
7. Synoptophore
8. Manifest concomitant
9. Squint concomitant
10. Paralytic squint
11. Head posture and its significance
12. Hess screening and its Interpretations
13. Pleoptics
14. Occlusion- types and uses
15. Nystagmus
16. A.V. Syndromes
17. Testing of ARC
18. Amblyopia
19. Disorders of accommodation
20. Paediatric visual acuity assessment
21. Paediatric Refraction
22. Neural aspects of binocular vision

PRACTICAL

1. Manifest squint work-up
2. Paralytic squint work-up
3. Pleoptics
4. Orthoptic Exercises

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SYLLABUS – THIRD YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – II

CLINICAL REFRACTION AND CONTACT LENSES

THEORY

A. CLINICAL REFRACTION

1. Emmetropia & Ammetropia- Aetiology, Population, Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. Presbiopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular re/ex
10. Accommodation & Convergence-1. Far point, near point, range, amplitude of accommodation
11. Accommodation & Convergence-2. Methods of measurements, NPA. AC IA ratio.
12. Retinoscopy-Principal & Methods
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16. Low-Vision aids: Techniques & microscopes
17. Rehabilitation of blinds

B. CONTACT LENS

1. History of contact Lens
2. Corneal Anatomy and Physiology
3. Corneal Physiology and Contact Lens
4. Preliminary Measurements and Investigations
5. Slit Lamp Biomicroscopy
6. Contact Lens materials
7. Optics of the Contact Lens
8. Indications and Contra Indications Contact Lens
9. Rigid gas permeable contact lens design
10. Soft Contact lens design & manufacture
11. Kertometry, Placildo's disc, Tonogrphy
12. Fitting of Spherical SCL and effect of parameter changes
13. Astigmatism correction options
14. Fitting Spherical RGP contact Lenses, Low OK, High OK
15. Effects of RGP contact Lens parameter changes on lens fitting
16. Fitting in Astigmatism (Sph RGP)
17. Follow-up post fitting examination
18. Follow-up Slit Lamp examination

19. Fitting in Keratoconus
20. Fitting in Aphakia, Pseudophakia
21. Cosmetic Contact Lenses
22. Fitting Contact Lens in children
23. Toric Contact Lenses
24. Bifocal Contact Lenses
25. Continuous wear and extended wear lenses
26. Therapeutic Lenses/Bandage lenses
27. Contact lens following ocular surgeries
28. Disposable contact lenses, frequent replacement and Lenses
29. Use of specular Microscopy and Pachymetry in Contact Lenses
30. Care & maintenance of Contact Lenses
31. Instrumentation in contact lens practice
32. Recent developments in Contact lenses

PRACTICAL

CLINICAL PREFRACTION

1. Refraction and prescription of glasses

CONTACT LENS

1. Contact Lens fitting
2. Counseling to Contact Lens patient
3. Post-fitting instructions
4. Remedy of post-fitting problems

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SYLLABUS – THIRD YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – III
COMMUNITY OPHTHALMOLOGY AND EYE BANK

THEORY

A. COMMUNITY OF OPHTHALMOLOGY

1. Concepts of community Ophthalmology-I
2. The Epidemiology of Blindness (General Principles)-I
3. The Epidemiology of Blindness (Disease specific strategies)-III
4. Survey Methodological-I
5. Screening procedures in Ophthalmology-I
6. School eye screening programme
7. Primary eye care
8. Organization of Out reach services
9. Organization of Reach-in-Programme
10. Information, Education, communication
11. Rehabilitation of the visually handicapped
12. National programme for control of Blindness-I
13. Vision 2020: The Right to sight

B. EYE BANK

1. Publicity
2. How to donate your eyes
3. Collection of eyes
4. Preservation of eyes
5. Pre-operative Instructions
6. Post-operative Instructions
7. Latest techniques for preservation of donor Cornea

PRACTICAL

A. COMMUNITY OPHTHALMOLOGY

1. Eye screening Programme & Surveys
2. Eye camp (approx.3) of 10 days each
3. PHC posting

B. EYE BANK

1. How to donate your eyes/Counseling
2. Collection of eyes
3. Preservation of eyes

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SYLLABUS – THIRD YEAR

BACHELOR OF OPTOMETRY (B.Optom.)

Paper – IV

INVESTIGATIONS IN CLINICAL OPHTHALMOLOGY AND MANAGEMENT OF O.T.

THEORY

A. INVESTIGATIONS IN CLINICAL OPHTHALMOLOGY

1. Principle, Techniques and preparation of the patient
2. ERG
3. EOG
4. Ultrasonography
5. Fluorescein Angiography
6. Ocular Photography-anterior segment
7. Syringing & Lacrimal function Test
8. Gonioscopy
9. Pachometry
10. Perimetry
11. Laser therapy
12. Contrast Sensitivity
13. Slit Lamp
14. VKG
15. Specular Microscopy
16. Fundus Photography
17. Colour Vision Investigations-Ishara Charts, E-G Lantern, Negal's anomaloscope, 100 Hue Test
18. A- Scan Biometry
19. Heidelberg Retina-tomography HRT-II
20. Nerve fiber analyzer
21. Frequency doubling perimeter
22. Non Contact Tonometry
23. UBM
24. OCT

B. MANAGEMENT OF OT

1. Introduction to Ocular infection in general
2. Asepsis: How to achieve in OT
3. Aanesthetic agents and where indicated
4. OT Sterilization procedures
5. Sterilization procedures of OT Instruments
6. Maintenance of Instruments and equipments: Ophthalmic Instruments
7. Maintenance of Instruments and equipments: Orthoptics Instruments
8. Maintenance of Instruments and equipments: Surgical Instruments
9. Maintenance of Instruments and equipments: Optometric & Contact Lens Equipment

PRACTICAL

1. Fluorescein Angiography
2. Syringing & Lacrimal function Test
3. Slit Lamp
4. VKG
5. Specular Microscopy
6. NCT
7. Applanation and schiotz tonometry
8. Dark Adaptometry
9. A-Scan Biometry
10. Contrast Senstivity
11. Perimetry
12. Keratometry
13. Focimetry
14. ERG/EOG/VER

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SEMINARS: All students have to attend seminars

TO BE PRESENTED BY FIRST YEAR

1. Optics

1.1 Frames & Spectacle Lens Materials
1.2 Quality control methods of Spectacle Lens
1.3 Application of focimeter and Genva lens measure in Optical dispensing

2. Refraction

2.1. Visual acuity methods
2.2. Principles and application of Retinoscopy
2.3. Explanation of various types of refractive error

3. Advanced Refraction

3.1 Comparison between Static and Dynamic Retinoscopy
3.2 Subjective methods of Refraction
3.3 Objective methods of Refraction

TO BE PRESENTED BY SECOND YEAR

1. Anterior Segments

1.1. Introduction of eye disorders
1.2. Physiology & Investigation for corneal disorders
1.3. Physiology & Investigation for lenticular disorders

2. Posterior segments

2.1. Anatomy and physiology of retina & optic nerve
2.2. Principles of direct & indirect Ophthalmoscopy
2.3. Principles of FA & Laser therapy

3. Tonometry

3.1. Principles & comparison of various types of tonometry
3.2. Standardization of various types of tonometers
3.3. Special methods in tonometry

4. Perimetry

4.1 Theoretical Comparison between Static & Kinetic Perimetry
4.2 Static & Kinetic Perimetry- practical view
4.3 Standardization of perimeters and the factors affecting its reliability

TO BE PRESENTED BY THIRD YEAR

1. Orthoptics

1.1. Diagnosis of latent and manifest squint
1.2. Paralytic squint investigations
1.3. Amblyopic and pleoptics treatment

2. Posterior Segments

2.1. Normal & Pathological funds
2.2. Funds Camera & application of FA
2.3. Lasers and its uses in Ophthalmology

3. Cornea and Refractive Surgery

3.1 Clinical investigations of pre-refractive Surgery
3.2 Clinical investigations of post –refractive Surgery
3.3 Clinical analysis of refractive Surgery

4. Advanced Refraction and Contact Lenses

4.1. Low vision aids for poor vision patients
4.2 Materials and manufacturing techniques of contact lenses
4.3 Indications & Contra-indications for Contact Lenses

5. Advanced Contact Lenses

5.1. Fitting philosophies of contact lenses
5.2. Post fitting problems of contact lenses and its remedy
5.3. Toric/Bifocal Contact lenses

6. Perimetry in Ocular disorders

6.1 Visual fields defects in Glaucoma
6.2 Visual fields defects in retinal & neurological disorders
6.3 Latest development in perimetry

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