CURRICULUM FOR

B.Sc. Optometry

(Applicable w.e.f. academic session 2017-18)

COURSE NAME: B.Sc. (Optometry)

DURATION OF COURSE: Four Years

FULL-TIME/ PART – TIME: FULL-TIME

SRI GURU RAMDAS UNIVERSITY OF HEALTH SCIENCES, SRI AMRITSAR, PUNJAB

1. BACHELOR OF SCIENCE in OPTOMETRY

Optometry is a paramedical field which deals with eyes, its structures, vision, visual system and vision information processing in human beings. The program is envisaged to develop a multipurpose ophthalmic manpower at paramedical level. The main objective of the course is to train a student to become a competent person in providing services as an Optician, Optometrist, Refractionist and Ophthalmic Assistant to the community in urban, semi-urban and rural settings in private, semi-Governmental and Governmental sectors.

This course is designed as a comprehensive theory and practical oriented program The mode of teaching will be in the form of regular classrooms, lectures / demonstrations supplemented by handouts, manuals, brochures, checklists, performance with supervised clinical practices.

2. Duration of Course

The Bachelor of Science in Optometry Course is proposed to be a 4 years integrated degree course including examination and one year compulsory internship.

3. Eligibility Criteria for Admission

The students shall be admitted as per the admission criteria and qualification prescribed in the Notification issued by the Board of Management of Sri Guru Ram Das University of Health Sciences from time to time.

4. Medium of Instructions

The Medium of instruction during the course and for the university examination shall be in English.

5. Examination Scheme

5.1 The examination for the first, second and third year shall ordinarily be held twice year in the months of May/June and November/ December by the Institute as per University rules.

5.2 Annual Examination shall be held in May/June and supplementary within 6 months of annual examination.

5.3 The examination in theory/practical shall be held at the end of the 1st academic year (1st Year) and the end of 2nd academic year (2nd Year) and third exam at the end of the 3rd academic year (3rd Year) with one internal and one external examiners.

5.4 Date of examination and appointment of examiner will be made by the Board of Management on recommendation of Faculty of Medical Sciences.

5.5 The examination for the first, second and third year of B.Sc. Optometry Course would be held according to the prescribed syllabus.

6. Rules of Examination for Bachelor of Science in Optometry Course:

6.1 The students shall submit his/her application for admission to the examination to Controller of Examinations SGRDUHS, Sri Amritsar through the Director Principal of the SGRDIMSAR, Sri Amritsar on the prescribed form with the required fee (the last

date of which will be updated on university website after notification issued from Board of Management time to time).

6.2 The candidates will be given 25 marks for theory and 15 marks for practical as internal assessment in each subject on the basis of their performance during the year. That a candidate be eligible to appear in the examination provided he/she secured a minimum of 35% marks in internal assessment in theory and practical.

6.3 There will be fresh internal assessment and compulsory attendance for the students for the examination in which he/she has failed at the time of subsequent examination in that subject.

6.4 The students will not be allowed to appear in the examination unless he/she attends 75% of the total theory and practical in each subject separately.

6.5 Director Principal of the college is empowered to condone the shortage of attendance of lectures to the extent of 5% lectures delivered in each course of theory and practical.

6.6 A student will be deemed to have passed in the examination if he/she passes in each subject separately.

6.7 In case of students joining late owing to the late admission with the approval of the Vice-chancellor, their lecturers are to be counted from the date of joining. Deficiency in studies should be made up by attending special classes for them at the level of Head of the Department.

7. First Year B.Sc. Optometry Examination:

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

B.Sc. Part – I

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Human Anatomy & Physiology	75	25	100	35	15	50	150
Paper-II	Ocular Biochemistry, Pathology & Microbiology	75	25	100	35	15	50	150
Paper-III	Ocular Anatomy and Physiology	75	25	100	35	15	50	150
Paper-IV	Physical and Physiological Optics	75	25	100	35	15	50	150
Supportive Subject	Basics of Computer	----	----	----	----	----	----	----

Note. The Examination in the subject of Basics of Computer will be conducted at college level and Grade will be sent to University for final inclusion in the result.

Grading System

Marks Range	81 - 100	76 - 80	71 - 75	61 - 70	51 - 60	41 - 50	31 - 40	0 - 30
Grade	**A+**	**A**	**B+**	**B**	**C+**	**C**	**D**	**E**

8. Second Year B.Sc. Optometry Examination:

The Second Year B.Sc. Optometry Examination shall be open to a person who has previously passed the First Year B.Sc. Optometry Examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University.

B. Sc. Part – II

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Ocular diseases and Pharmacology	75	25	100	35	15	50	150
Paper-II	Refraction	75	25	100	35	15	50	150
Paper-III	Investigative Ophthalmology	75	25	100	35	15	50	150
Paper-IV	Ophthalmic instruments and appliances	75	25	100	35	15	50	150

9. Third Year

The Third Year B.Sc. Optometry Examination shall be open to a person who has previously passed the Second Year B.Sc. Optometry Examination of this University.

B.Sc. Part-III

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Clinical & advanced Optics & Orthoptics	75	25	100	35	15	50	150
Paper-II	Clinical Refraction and Contact lenses	75	25	100	35	15	50	150
Paper-III	Community Ophthalmology, Eye Bank	75	25	100	35	15	50	150
Paper-IV	Investigations in Clinical Ophthalmology	75	25	100	35	15	50	150

10. Promotion and Number of Attempts allowed

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

10.2 A Candidate who fails in one more or more subjects will be given four attempts including first attempt as a regular candidate, plus one mercy chance at the discretion of the Vice-Chancellor, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.

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

10.4 A candidate who passes in at least one subject of University level First Year B.Sc. Optometry examination will be permitted to attend classes of Second Year. However, the candidate will be required to pass in all subjects of 1st Year examination at least 6 months before the final examination of 2nd Year examination.

10.5 A candidate who fails in all subjects in the second year B.Sc. Optometry examination shall not be promoted to Third Year class.

10.6 A candidate who passes in at least one subject of University level Second Year B.Sc. Optometry examination will be permitted to attend classes of Third Year. However, the candidate will be required to pass in all subjects of 2nd Year examination at least 6 months before the final examination of 3rd Year examination.

10.7 Candidate who passes in one or more subjects of Second Year B.Sc. 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, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.

10.8 Candidate who passes in one or more subjects of **third Year** B.Sc. 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, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.

11. Appointments of Examiners:

11.1 There shall be two examiners – One internal and one external.

11.2 Professor & head of the Department shall be Convener. The Examiner at least 3 years post PG teaching experience in that specification field will be appointed as Internal Examiner.

11.3 The external examiner shall be appointed from other Universities at least 3 years post PG teaching experience in that specification field.

12. Paper Setting and moderation of Question Papers

The questions papers for 1st Year, 2nd Year and 3rd Year will be set under the direction of Controller of Examinations.

Each Question Paper covering entire course consists of seven questions out of which six questions carry 10 Marks and one question carry 15 marks.

13. 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 Controller of Examinations.

14. Minimum Pass Marks

During all the three annual examinations in each subject paper the candidate shall have to obtain 50% in theory, practical & internal assessment taken together.

14.1 The successful candidates shall be classified into divisions as under:-

a) Those who obtain 60% or more marks First Division.
b) Those who obtain 50% or more marks but below 60% marks Second Division.
c) A candidate who will obtain 75% or more marks of the total marks in any subject shall be declared to have obtained distinction in that subject provided he/she passed in all the subjects of the courses in all the parts in the first attempt.

A candidate is eligible to appear in the examination provided he/she secures a minimum of 35% marks in internal assessment in theory and practical separately.

15. Grace Marks

There shall be no provision for grace marks.

16. Declaration of Result

The results will be tabulated and declared by the Controller of Examination's office.

17. Award of Degree

On successfully passing the Third Year B.Sc. Optometry examination the students shall be awarded the degree of Bachelor of Sciences in Optometry.

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Paper - 1: Human Anatomy & Physiology (50 hours each subject)

Theory Syllabus

Anatomy

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.

Visual & auditory pathways

Practical Syllabus(20 Hours):

1. **Demonstration** of all bones of the human body.
2. **Demonstration** of all organs of the human body.
3. **General 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.

Books Recommended

1. Ross and Wilson, Anatomy and Physiology, Churchill Livingstone.
2. Companion Pocketbook for quick review B.D. Chaurasia's Human Anatomy: -Vol. (1,2,3)
3. B.D. Chaurasia’s Human Anatomy -Vol. (1,2,3)
4. B.D. Chaurasia’sHandbook of General Anatomy
5. Textbook of Anatomy & Physiology for Nurses- Nachiket Shankar/ Mario Vaz
6. Anatomy for B.Sc. Nursing – Dr Renu Chauhan

PHYSIOLOGY (50 hours)

THEORY

1. General physiology
2. Nerve muscle physiology
3. Cardiovascular System
4. TheBlood – physiology
5. Digestivesystem(Liver, Gall bladder, Pancreas &Spleen)
6. Respiratorysystem

7. EndocrineOrgans
8. ExcretorySystem
9. Reproductivesystem
10. Central NervousSystem and peripheral nerves
11. Sensory organs(Ear, Nose, Throat)

PRACTICALS (20 hours)

1. The compound microscope
2. Demonstrate blood cell count, coagulation, grouping, Hb, BP, and pulse monitoring
3. Determintion of ESR-by westergren's method
4. Determination of blood groups.
5. Measurement of human blood pressure.
6. Examination of respiratory system to count respiratory rate
7. Demonstrate Spirometry

Books Recommended

1. Ross & Wilson Anatomy and Physiology in Health and Illness
2. BD Chaurasia's Handbook of General Anatomy
3. Textbook of anatomy and Physiology for Nurses
4. Basics of medical physiology –D Venkatesh, HH Sudhakar
5. Manual of practical physiology for BDS –Dr. A.K. Jain

Paper - 2: Ocular Biochemistry, Pathology & Microbiology

Theory Syllabus

1. OCULAR BIOCHEMISTRY (30 hours)

1. Introduction to various biochemical test
2. Tears film and pH
3. General Introduction to metabolic processes affecting the eye
4. Rhodopsincycle
5. Aqueous and Vitreous humours
6. Metabolism of lens and cornea.

2. OCULAR PATHOLOGY (30 hours)

Haematology

1. Blood Cells and blood collection techniques
2. Haemoglobinestimation
3. Total leucocytecount
4. Differential leucocytecount
5. Erythrocyte sedimentationrate
6. Pheripheral blood film – staining, significance of a peripheral smear
7. Bleeding time, clotting time

Clinical Pathology

8. Urine collection methods
9. Physical Examination of Urine
10. Chemical Examination of Urine
11. Microscopic Examination of Urine

Histopathology

12. Grossing of tissue
13. Tissue processing
14. Fixation of tissue
15. Section cutting
16. Staining–Hematoxylin & Cosin and Special Stains

3. OCULAR MICROBIOLOGY (20 hours)

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 Syllabus

OCULAR BIOCHEMISTRY (20 hours)

1. Sampling and Collection of Blood
2. pH measurement
3. Osmolarity
4. Biochemical tests, including blood sugar estimation
5. Ketone bodies inurine
6. Spectrophotometry
7. Serum-cholesterol

OCULAR PATHOLOGY (20 hours)

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

OCULAR MICROBIOLOGY (20 hours)

1. Sterlization
2. Introduction to Microbiology: Culture media, Classification, Morphological, Lab. Diagnosis of infection
3. Collection of samples
4. Serology
5. Culture media for bacteria, fungi and viruses
6. Oxidase test
7. Mantoux test
8. Staining procedures: GramStaining

9. Staining procedures: Romanowskystains
10. Staining procedures: ZiehlNeelsen'sstaining

Paper - 3: Ocular Anatomy & Physiology

Theory Syllabus

OCULAR ANATOMY

1 Embryology of the eye ingeneral
1. Anatomy of Orbit and its immediaterelations
2. Lids and eye lidglands
3. Conjunctiva. Cornea and Sclera
4. Iris and Ciliary body
5. Lens and Vitreous
6. Retina &Choroid
7. Ocular Muscles
8. Visual pathways
9. Sympathetics and parasympathetic system
10. Vascular supply of eye
11. Lacrimal apparatus
12. Higher visual centers

OCULAR PHYSIOLOGY

1. General physiology of the eye – An introduction
2. Maintenance of Transparency of the Cornea
3. Maintenance of Transparency of the Lens
4. Visual acuity and form sense
5. Pupillary reflexes Accommodation
6. Convergence
7. Intra Ocular Pressure
8. Night Vision
9. Colour Vision
10. Visual Fields
11. Extrinsic Muscles, Actions and Ocular Movements
12. Higher Visual Centres and righting reflexes
13. Electro physiological Aspects
    Conjugate and Disguate -Movements of the eye

Practical Syllabus

1. ORTHOPTICS

1. Latent squintwork-up
2. Synptophore
3. Maddoxwing
4. Maddoxrods
5. Prismbar
6. Near point of accommodation
7. Near point ofconvergence

Fusionexercises

OCULAR PHYSIOLOGY (20 hours)

1. The compound microscope
2. Demonstrate blood cell count, coagulation, grouping, Hb, BP, and pulse monitoring
3. Determintion of ESR-by westergren's method
4. Determination of blood groups.
5. Measurement of human blood pressure.
6. Examination of respiratory system to count respiratory rate
7. Demonstrate Spirometry

Books Recommended:

1. Anatomy & Physiology By AK Khurana

Paper – 4: Physical and Physiological Optics (100 Hours)

Theory Syllabus

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 &Toricsurfaces, Aspheric surfaces
8. Prisms -definition, uses, nomenclature, apex
9. Determination of focal length &diopteric power of lens
10. Strum'sConoid
11. Neutralization of lenses
12. Focimeter
13. Centre & Axis Marking byfocimeter
14. Simple &Torictransposition
15. Prismatic effect &Decentration
16. Aberrations & Tints in spectacleLenses
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 Schematiceye
20. Emmetropia &Ammetropia-Aetiology, Population, Distribution, Growth of eye,
21. Myopia
22. Hypermetropia
23. Astigmatism
24. Aphakia/Pseudo-phakia
25. Presbyopia

26. Keratoconus
27. Post-Op. Refractive errors
28. Refraction of irregular reflex
29. Accommodation&Convergence 1,Farpoint,nearpoint,range,amplitudeofaccommodation
30. Accommodation &Convergence -2. Methods of measurements, NPA. AC/A ratio.
31. Retinoscopy -Principle &Methods
32. Objective Refraction
33. Subjective Refraction
34. Cross Cylinder
35. Workshop
36. Manufacturing Spectacle Lens
37. Plastic Lenses -Manufacturing &Characteristic
38. Lens Designs-Aspheric
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. Final Checking & Adjustments to prescriptions
49. Patient complains, handling correction.
50. Repair of spectacles
51. Special types of spectacles monocells/ptosis hemianopicglasses
52. Test chart standards
53. Phoropter
54. Objective Optometer
55. Projection Charts
56. Refraction room Standards

Practical Syllabus

OPTICS

1. Workshop
2. Manufacturing SpectacleLens
3. Manufacturing BifocalLenses
4. Measurement for ordering spectacle, IPD, Marking centration, V. D.Calculation.
5. Fitting Bifocals, Multifocals, PrismLenses
6. Fitting Lenses inFrames
7. Glazing &Edging
8. Final Checking, Adjustments toprescriptions
9. Patient complains, handling correction.
10. Repair of spectacles
11. Special types of spectacles monocells/ptosis hemianopicglasses Neutralization

oflenses
12. Focimeter
13. Shape of Spectacle Frame -Measurements & Making, Frame & Face Measurements
14. Refraction under thesupervision

Books Recommended:

1. Optics & Refraction By AK Khurana

BASICS OF COMPUTER

Theory : 30 hours
Practical's : 30 hours
THEORY

Introduction to computer – I/O devices – memories – RAM and ROM – Different kinds of ROM – kilobytes. MB, GB their conversions – large computer – Medium, Micro, Mini computers - Different operating system – Networking – LAN, WAN, MAN (only basic ideas)

Typing text in MS word – Manipulating text – Formatting the text – using different font sizes, bold, italics – Bullets and numbering – Pictures, file insertion – Aligning the text and justify – choosing paper size – adjusting margins – Header and footer, inserting page No's in a document – Printing a file with options – Using spell check and grammar – Find and replace – Mail merge – inserting tables in a document.

Creating table in MS-Excel – Cell editing – Using formulas and functions – Manipulating data with excel – Using sort function to sort numbers and alphabets – Drawing graphs and charts using data in excel – Auto formatting – Inserting data from other worksheets.

Preparing new slides using MS-POWERPOINT – Inserting slides – slide transition and animation – Using templates – Different text and font sizes – slides with sounds – Inserting clip arts, pictures, tables and graphs – Presentation using wizards.

Introduction to Internet – Using search engine – Google search – Exploring the next using Internet Explorer and Navigator – Uploading and Download of files and images – E- mail ID creation – Sending messages – Attaching files in E- mail.

Role of Computers in the Health care: - HIS, Medical Equipment, Pharmacy in inventory management, Patient record maintenance.

PRACTICAL

- Typing a text and aligning the text with different formats using MS-Word
- Inserting a table with proper alignment and using MS-Word - Create mail merge document using MS-word to prepare greetings for 10 friends
- Preparing a slide show with transition, animation and sound effect using MSPowerpoint
- Customizing the slide show and inserting pictures and tables in the slides using MSpowerpoint
- Creating a worksheet using MS-Excel with data and sue of functions Using MSExcel prepare a worksheet with text, date time and data Preparing a chart and pie diagrams using MS-Excel
- Using Internet for searching, uploading files, downloading files creating e-mail ID

Syllabus of Second Year
Paper – 1: Ocular disease and Pharmacology (50 hours)

Theory Syllabus

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

Practical Syllabus

1. Dilution of drug in different concentration
2. Steroid detection test
3. Application of following eye drops:
    - 3.1 Pilocarpine
    - 3.2 Glycerin
    - 3.3 Homatropine
    - 3.4 Artificial eye drops
    - 3.5 EDTA
    - 3.6 Sulphacetamide
    - 3.7 Dexamethasone
    - 3.8 Methylcellulose
    - 3.9 Saline eye drops
    - 3.10 Sodium citrate eye drops
4. Autologous serum eye drops preparation
5. Dilution and fortification of eye drops
6. Fluorescein strips, Rose Bengal Strips preparation
7. Dosage forms

Books Recommended:

1. Ocular Pharmacology By SK gupta
2. Ophthalmology By AK Khurana

Paper – 2: Refraction

Theory Syllabus

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 reflex
10. Accommodation&Convergence– 1.Farpoint,nearpoint,ranges.Amplitudeofaccommodation
11. Accommodation & Convergence – 2. Methods of measurements, NPA. AC/A ratio.
12. Retinoscopy -Principle &Method
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16.

Practical Syllabus

1. Refraction and prescription of glasses in OPD

Books Recommended:

1. Optics & Refraction By AK Khurana

Paper – 3: Investigative Ophthalmology

Theory Syllabus

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. Synoptophore
9. Manifest concomitant
10. Squint concomitant
11. Paralytic Squint
12. Head posture and its significance

13. Hess Screening and its Interpretations
14. Pleoptics
15. Occlusion -types and uses
16. Nystagmus
17. A. V.Syndromes
18. Testing of ARC
19. Amblyopia
20. Disorders of accommodation
21. Paediatric visual acuity assessment
22. Paediatric Refraction
23. Neural aspects of binocular vision

Practical Syllabus

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

Books Recommended:

1. Ophthalmology By AK Khurana
2. Squint & Orthoptics By AK Khurana

Paper - 4: Ophthalmic instruments and appliances

Theory Syllabus

1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope
3. Slit Lamp: Haag-Streit.
4. Photo-slit lamp
5. Lensometer. Lensgauge
6. Tonometer
7. Fundus Camera
8. External eye photography
9. Auto-refractometer
10. Corneal Examination -1. Placidodisc
11. CornealExamination-2.Keterometer
12. CornealExamination-3.VKG
13. Corneal Examination -4. Specular Microscopy
14. CornealExamination-5.Aesthesiometer
15. Exophthalmometer
16. Perimeter – Manual &automated
17. Orthoptics Instruments –Haploscope /Homedevices
18. Heidelberg Retino-tomography HRT-II
19. Nerve fiberanalyzer

20. Frequency doubling perimeter
21. Non Contact Tonometer
22. HeidelbergAnalmascope
23. Pachometers
24. Contrast sensitivity tests
25. Glare acuity tests
26. Colour vision tests
27. Dark adaptometer

Practical Syllabus

1. Lensometer, Lensgauge
2. Tonometer
3. Placidodisc
4. Keterometer
5. VKG
6. Specular Microscopy
7. Exophthalmometer
8. Perimeter
9. Non Contact Tonometer
10. Slit Lamp: Haag-Streit.
11. Photo-slit lamp
12. Fundus Camera
13. Contrast sensitivity tests
14. Glare acuity tests
15. Colour vision tests
16. Darkadaptometer

Books Recommended:

1. Squint & Orthoptics By AK Khurana
2. Ophthalmology By AK Khurana

B.Sc. Optometry 3rd Year

Paper – 1: Clinical & advanced Optics & Orthoptics

Theory Syllabus

1. Orthoptic-Generalconcept
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. 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 Syllabus

1. **CLINICAL & ADVANCEDORTHOPTICS**
   - 1.1 Manifest squint work-up
   - 1.2 Paralytic squint work-up
   - 1.3 Pleoptics
   - 1.4 Orthoptic Exercises
2. **CLINICAL & ADVACEDOPTICS**
   - 2.1 Refraction and prescription of glasses in independent cabin

Books Recommended:

1. Squint & Orthoptics By AK Khurana
2. Ophthalmology By AK Khurana

Paper – 2: Clinical Refraction and Contact lenses

Theory Syllabus

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 Lensmaterials
7. Optics of the Contact Lens
8. Glossary of Terms: Contact Lenses
9. Indications and Contra Indications Contact Lens
10. Rigid gas permeable contact lens design
11. Soft Contact lens design &manufacture
12. Keratometry, Placido'sdisc,Tonography
13. Fittingphilosophies
14. Fitting of Spherical SCL and effect of parameter changes
15. Astigmatism correction options
16. Fitting Spherical RGP contact Lenses, Low OK, High OK
17. Effects of RGP contact Lens parameter changes on lens fitting
18. Fitting in Astigmatism(SphRGP)
19. Follow-up post fitting examination
20. Follow-up Slit Lamp examination
21. Fitting in Keratoconus
22. Fitting in Aphakia , Pseudophakia
23. Cosmetic Contact Lenses
24. Fitting Contact Lens in children
25. Toric Contact Lenses
26. Bifocal Contact Lenses
27. Continuous wear and extended wear lenses
28. Therapeutic Lenses/Bandage lenses
29. Contact lens following ocular surgeries
30. Disposable contact lenses, frequent replacement and Lenses
31. Use of Specular Microscopy and Pachymetry in Contact Lenses
32. Care & maintenance of Contact Lenses
33. Contact Lens modification of finished lenses
34. Instrumentation in contact lens practise
35. Checking finished lenses parameters
36. Recent developments in Contact lenses
37. Review of lenses available in India

CLINICAL & ADVACED REFRACTIONS

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.Farpoint,nearpoint,range,amplitudeofaccommodation
11. Accommodation &Convergence -2. Methods of measurements, NPA, AC/ A ratio.
12. Retinoscopy -Principle &Method
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16. Low- Vision aids: Techniques &microscopes
17. Rehabilitation of blinds

Practical Syllabus

1. **CONTACT LENS**
   - 1.1 Contact Lens fitting
   - 1.2 Counseling to Contact Lens patient
   - 1.3 Post-fitting instructions
   - 1.4 Remedy of post-fitting problems
2. **CLINICAL & ADVACEDREFRACTIONS**
   - 2.2 Refraction and prescription of glasses

Books Recommended:

1. Contact lens By Monika Choudhary
2. Optics & Refraction By AK Khurana

Paper - 3: Community Ophthalmology, Eye Bank

Theory Syllabus

EYEBANK

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

COMMUNITY OPHTHALMOLOGY

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

Practical Syllabus

1. EYEBANK

1.1 How to donate your eyes/Counseling
1.2 Collection of eyes
1.3 Preservation of eyes

2. COMMUNITY OPHTHALMOLOGY

2.1 Eye Screening Programme&Surveys
2.2 Eye camp (approx. 3) of 10 days each
2.3 PHCposting

Books Recommended:

1. Ophthalmology By AK Khurana

Paper – 4: Investigations in Clinical Ophthalmology

Theory Syllabus

1. Principle, Techniques and preparation of the patient

2. ERG
3. EOG
4. Electro-Oculomyo-gram
5. Ultra-sono-graphy
6. Tonography
7. Berman's Locator/Foreign body locator
8. Fluorescein Angiography
9. Ocular Photography -anterior segment
10. Dark Adaptometry: Adaptation & Adaptometry
11. Syringing & Lacrimal functionTest
12. Gonioscopy
13. Pachometry
14. Perimetry
15. Lasertherapy
16. Contrast Sensitivity
17. Slit Lamp
18. VKG
19. Specular Microscopy
20. Fundus Photography
21. Colour Vision Investigations – Ishhara Charts, E-G Lantern, Negal'sanomaloscope, 100 Hue Test
22. A -ScanBiometry
23. Heidelberg Retina-tomography HRT–II
24. Nerve fiberanalyzer
25. Frequency doubling perimeter
26. Non Contact Tonometry
27. UBM
28. OCT

MANAGEMENT OF OT

1. Introduction to Ocular ingeneral.
2. Asepsis: How to achieve
3. Aanesthetic agents and where indicated
4. OT Sterilization procedures
5. Sterilization procedures of 0 T 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 Syllabus

1. INVESTIGATIONS IN CLINICALOPHTHALMOLOGY

1.1 Fluorescein Angiography
1.2 Syringing & Lacrimal functionTest
1.3 Slit Lamp
1.4 VKG
1.5 Specular Microscopy

1.6 NCT
1.7 Applanation and schiotz Tonometry
1.8 DarkAdaptometry
1.9 A -ScanBiometry
1.10 Contrast Sensitivity
1.11 Perimetry
1.12 Keratometry
1.13 Focimeter
1.14 ERG/EOG/VER

Books Recommended:

1. Squint & Orthoptics By AK Khurana
2. Ophthalmology By AK Khurana