

Regulation of Bachelor of Optometry Degree course (4 Years)

The regulations & syllabus are subject to modifications by the standing Board of studies for allied and HealthCare courses time to time.

Regulations:-

1. Duration: -

The Bachelor of optometry undergraduate degree program is of four years duration (3+1) including one year of compulsory internship.

Duration of the course: 4 (including one year compulsory internship)

Total hours -3800 (didactics+ practical +internship) (300 additional hours to be spent on research project)

2. Medium of instruction -

Medium of teaching instruction & examination shall be in English.

3. Eligibility for admission

(A). for First Year

(i). A candidate seeking admission to the Bachelor degree course in allied and Health Care courses should have passed in 10+2 or equivalent exam (Bihar Intermediate Council, CBSE, ICSE or other Boards) with Physics, chemistry, Biology and English as Principal Subjects of study.

(ii) Passed in Vocational higher secondary education courses recognized by Govt. body (state or central) with physics, chemistry, Biology & English as equivalent to 10+2 examination.

(iii) The candidate who is going to appear in the final examination of 10+2 or intermediate or equivalent will also be eligible for such courses.

(B) For Lateral Entry (Second Year)

(i) For Lateral entry to second year in Bachelor degree course in allied and Health Care courses, candidates should have passed two years Diploma in Ophthalmic Assistant from a Govt. recognized Paramedical Institute or Board.

Note: Admission is done of candidates selected by qualifying exam conducted by Board authorized by Govt. of Bihar.

4. Attendance -

(a) Every candidate should have attendance at least 75% of total number of classes conducted in an academic year from date of commencement of the term to the Last

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working day for that year in theory & practical separately. Only such candidates are eligible for the University examination.

(b) A student who does not fulfil the minimum required attendance in an academic year must complete the required attendance through extra classes assigned by the institute.

(c) Condonation of shortage in aggregate attendance up to 10% (between 65% and 75%) in every year may be granted by the institute's academic committee under special circumstances (candidates having good academic and behavioral record). Relaxation will be given in special circumstances on medical ground for 10% extra. Note: Total condonation shall not exceed more than 15% for a particular candidate.

5. Internal Assessment-(IA)

(a) Internal assessment will be done in each subject and the marks will be awarded to the candidate as detailed in the scheme of examination. There should be a minimum interval of four months between two periodical tests (theory & practical) in one academic year.

The marks of Internal Assessment shall be communicated to the University fifteen days before the commencement of University exam

(b) Best of two periodical tests will be communicated to University.

(c) Internal Assessment question pattern will be decided by faculty members.

6. Subjects and hours of teaching for theory and practical

(a) Subjects and number of hours of teaching, theory and practical in 1st year, 2nd year, 3rd year and 4th are as shown in TABLE-I, TABLE-2, TABLE-3 & TABLE-4 for a particular bachelor course.

7. Schedule of Examination-

(a) Authority for conducting the examination and award of degree is controller of examination, AryaBhatta Knowledge University (AKU).

(b) Regular examination - shall be conducted at the end of 1st year, 2nd year, 3rd year (Both main and subsidiary subjects) and IN 4th year Project Work & VIVA during Internship.

1st year - All main subjects without practical university examination.

2nd year + 3rd year University exam (Both theory & Practical)

4th year – Viva and Research project (No university examination) at Parent Institution by Faculty Members


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(c) Supplementary examination shall be conducted after six weeks of final examination results. Scheme of examination will be same as that of regular exam.

(d) Distribution of marks in Internal Assessment and university examination in both theory and practical in both main and subsidiary subjects are shown in TABLE-5, TABLE -6, TABLE -7, and TABLE-8 for each year.

(e) On 4th year, also a separate marks sheet with provisional passing certificate will be issued.

8. Passing criteria:-

(i). 1st YEAR

(a) Main subjects- A candidate is declared to have passed in a subject if he / she secures 50% of marks in university exam and Internal Assessment added together in main subjects.

(b) Grace Marks- As per AKU rules.

(c) Subsidiary subjects- A minimum prescribed passing marks in subsidiary subjects should be 30% of marks in university & Internal Assessment added together.

(ii). 2nd & 3rd year

(a) Main subject-A candidate is declared to have passed the examination in a subject if he/she secures 50% of marks in theory & practical separately in university exam. Marks obtained in internal assessment will be added to the theory paper.

(b) Subsidiary subject- Same as 1st year

(c) If a candidate fails in either theory or practical exam in 2nd or 3d year will have to appear for both in next examination.

9. Carry over benefit-

(a) 1st year - A candidate who fails in the subjects shall be permitted to carry over these subjects to 2nd year but must pass before proceeding into 3d year exam.

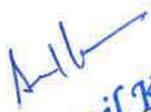
(b) 2nd year - candidate is permitted to carry over subjects but must pass before appearing for 3rd year exam.

(c) 3rd year – same as but must clear all backlog before commencement of internship.

Conclusion -A candidate should have cleared all the main and subsidiary paper of 1st year, 2nd year and 3rd year before appearing for 4th Year Internship.


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(d) If any candidate is not able to clear all his subjects (1st year, 2nd year, 3rd, 4th year) from the university exam within eight years from date of admission, his candidature will be cancelled permanently from the institution.

(e) For lateral entry courses- Time limit for clearance of subjects 2nd year, 3rd year & 4th year will be seven years.

10. Distribution of class –

Distinction – 75% in main subjects as grand total

1st division 60% in main subjects as grand total

2nd division 50% in main subjects as grand total

11. Award of degree

A candidate will be eligible for Degree of Bachelor of optometry in the course where they have undergone the prescribed course of study for period of not less than 4 years and have passed the prescribed examination in all subjects with completion of compulsory one year internship included in the duration.

Note: - Compulsory Internship shall include rotational clinical assignments, administrative skills and a scientific project over a period of 52 weeks .On successful completion of Internship, to the satisfaction of the Heads of Dept. and the Dean/Principal of the college the Internship completion certificate shall be issued by the college and it will be forwarded to the University for the award of Bachelor of Optometry Degree.

12. Clinical posting

(a) 1st year, 2nd year & 3rd year - Practical & clinical classes will be held in respective department in PHI & PMCH.

(c) 4th Year- clinical internship after clearing 3rd year

13. Criteria for Internship - One Year duration (after completion of 3rd year)

(a) One year internship in PMCH in Ophthalmology Department.

Or

(b) One Year internship in- (i) Govt. of Bihar hospitals

(ii) Central Govt. / Autonomous hospitals (iii) Specialized NGO hospitals

Note: -

- i. Internship is for 12 months or 1 year. Total number of days (after deducting for national holidays & Sundays + Examination): 250 days (6 days / week; 6 hours / day) = 1500 hours or minimum of 18 weeks /semester (216 days). After passing 3rd year exam clearing all backlog before starting one year of compulsory internship.

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- ii. Project report (thesis) needs to be submitted during internship.
- iii. In Case, if 4th year Viva exam held before completion of internship, students can ask permission for exam from concerned institute.
- iv. 4th year teaching will be accomplished during along with internship by the concern institute.
- v. Post-examination will be continuing the remaining internship and days for which students are engaged in exam will add-up in their internship.

GENERAL -

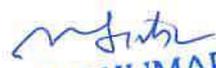
Internship is a phase of mandatory training, on full time basis, where in a candidate is expected to conduct actual Clinical Optometry practice, with fair independence in clinical decision making in low task cases where as to work under supervision at high task areas so that at the end of Internship he/ she is capable to practice Optometry profession independently.

Since Optometry profession have been mentioned in UGC gazettes for regulation of its nomenclature and the Rules and Regulations recommended by the National Commission for Allied and Healthcare Professions Act 2021 regulating body Allied Health section, MOHFW which is accepted by the University shall be implemented for regulation of its education and others.

14. Name of Allied and HealthCare Degree Course –

- **Bachelor in Optometry**


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TABLE-1

SUBJECT

BACHELOR OF OPTOMETRY

SUBJECT – 1st YEAR- TEACHING HOURS (TOTAL- 600 hrs)

MAIN SUBJECTS	THEORY (hrs)	PRACTICAL (hrs)	TUTORIAL (hrs)	TOTAL (hrs)
(1) ANATOMY (General & ocular)	100	20	10	130
(2) PHYSIOLOGY (General & ocular)	100	20	10	130
(3) VISUAL OPTICS	100	20	10	130
(4) a. MICROBIOLOGY (General & ocular)	40	10	5	110
b. BIOCHEMISTRY (General & ocular)	40	10	5	
TOTAL	380	80	40	500
<u>SUBSIDIARY SUBJECT</u>				
(1) COMMUNICATIVE SKILLS (ENGLISH)	40	Nil	10	50
(2) COMPUTER SKILLS	20	20	10	50
TOTAL	60	20	20	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 600 hrs

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TABLE-2

SUBJECT

BACHELOR OF OPTOMETRY

SUBJECT - 2nd YEAR- TEACHING HOURS (TOTAL- 600 hrs)

MAIN SUBJECTS	THEORY (hrs)	PRACTICAL (hrs)	TUTORIAL (hrs)	TOTAL (hrs)
(1) OCULAR PHARMACY & PHARMACOLOGY	80	20	20	120
(2) OPTICS & REFRACTION, OPHTHALMIC INSTRUMENT & APPLIANCES	100	50	40	190
(3) INVESTIGATIVE OPHTHALMOLOGY & ORTHOPTICS	100	50	40	190
TOTAL	280	120	100	500
<u>SUBSIDIARY SUBJECT</u>				
(1) COMPUTER	20	20	10	50
(2) PUBLIC HEALTH	20	20	10	50
TOTAL	40	40	20	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 600 hrs

CLINICAL POSTING

1. EYE OPD & INDOOR----- TWO MONTHS
2. REFRACTION ----- TWO MONTHS
3. GENERAL EYE O.T. ----- ONE MONTH
4. SQUINT CLINIC -----ONE MONTH
5. GLUCOMA + OCCULAR PHYSIOTHERAPHY -----ONE MONTH
6. GENERAL EYE O.T. ----- ONE MONTH

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TABLE-3

SUBJECT

BACHELOR OF OPTOMETRY

SUBJECT – 3rd YEAR- TEACHING HOURS (TOTAL- 800 hrs)

MAIN SUBJECTS	THEORY (hrs)	PRACTICAL + TUTORIAL (hrs)	CLINICAL POSTING (hrs)	TOTAL (hrs)
(1) OCULAR DISEASES	70	10 + 20	Nil	100
(2) CONTACT LENS , OCULAR INJURY & EMERGENCY	50	30 + 20	200	300
(3) COMMUNITY OPHTHALMOLOGY, EYE BANK AND LOW VISION	50	30 + 20	200	300
TOTAL	170	130	400	700
<u>SUBSIDIARY SUBJECT</u>				
(1) OPHTHALMIC O.T MANAGEMENT	35	15	Nil	50
(2) HOSPITAL WASTE MANAGEMENT	35	15	Nil	50
TOTAL	70	30	----	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 800 hrs

CLINICAL POSTING

1. EYE OPD & INDOOR ----- TWO MONTH
2. REFRACTION ----- ONE MONTH
3. GENERAL EYE O.T. ----- ONE MONTH
4. RETINAL CLINIC ----- ONE MONTH
5. GLUCOMA + OCCULAR PHYSIOTHERAPHY ----- ONE MONTH
6. COMMUNITY OPHTLAMOLOGY ----- ONE MONTH
7. EYE BANK ----- ONE MONTH

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TABLE-4

SUBJECT

BACHELOR OF OPTOMETRY

CLINICAL INTERNSHIP + PROJECT WORK 4th YEAR- HOURS

(TOTAL- 1800 HRS)

MAIN SUBJECTS	PRACTICAL + TUTORIAL (hrs)	CLINICAL POSTING (hrs)	TOTAL (hrs)
(1) INTERNSHIP	200	1300	1500
(2) INTERNSHIP & RESEARCH PROJECT	100	200	300
TOTAL	300	1500	1800

MINIMUM CLINICAL INTERNSHIP (hrs)----- TOTAL 1500 hrs
PROJECT WORK (hrs)----- TOTAL 300 hrs

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TABLE-5

SUBJECT

BACHELOR OF OPTOMETRY

DISTRIBUTION OF MARKS FOR 1st YEAR UNIVERSITY EXAM (TOTAL-500 MARKS)

MAIN SUBJECTS	THEORY		IA (THEORY MARKS)	TOTAL MARKS	
	Hrs	MARKS			
(1) ANATOMY (General & ocular)	3 hrs	70	30	100	
(2) PHYSIOLOGY (General & ocular)	3 hrs	70	30	100	
(3) VISUAL OPTICS	3 hrs	70	30	100	
(4) a. MICROBIOLOGY (General & ocular)	1.5 hrs	35	15	100	
b. BIOCHEMISTRY (General & ocular)	1.5 hrs	35	15		
TOTAL	280		120	400	
<u>SUBSIDIARY SUBJECT</u>	THEORY		IA (THEORY MARKS)	<u>PRACTICAL</u>	TOTAL MARKS
	Hrs	MARKS			
(1) COMMUNICATIVE SKILLS (ENGLISH)	1.5 hrs	35	15	Nil	50
(2) COMPUTER SKILLS	1.5 hrs	20	15	15	50
TOTAL		55	30	15	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 500 MARKS

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TABLE-6

SUBJECT

BACHELOR OF OPTOMETRY

DISTRIBUTION OF MARKS FOR 2nd YEAR UNIVERSITY EXAM (TOTAL-500 MARKS)

MAIN SUBJECTS	THEORY Hrs MARKS	IA THEORY + PRAC. = TOTAL MARKS	PRACTICAL +VIVA= TOTAL MARKS	TOTAL MARKS
(1) OCULAR PHARMACY & PHARMACOLOGY	3 hrs 70	20 + 10 = 30	Nil	100
(2) OPTICS & REFRACTION, OPHTHALMIC INSTRUMENT & APPLIANCES	3 hrs 70	20 + 10 = 30	40 + 10 = 50	150
(3) INVESTIGATIVE OPHTHALMOLOGY & ORTHOPTICS	3 hrs 70	20 + 10 = 30	40 + 10 = 50	150
TOTAL	210	90	100	400
<u>SUBSIDIARY SUBJECT</u>	THEORY Hrs MARKS	IA THEORY + PRAC. = TOTAL MARKS	PRACTICAL +VIVA= TOTAL MARKS	TOTAL MARKS
(1) COMPUTER	1.5 hrs 20	15	10 + 5 = 15	50
(2) PUBLIC HEALTH	1.5 hrs 20	15	10 + 5 = 15	50
TOTAL	40	30	30	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 500 MARKS

CLINICAL POSTING

- 7. EYE OPD & INDOOR----- TWO MONTHS
- 8. REFRACTION ----- TWO MONTHS
- 9. GENERAL EYE O.T. ----- ONE MONTH
- 10. SQUINT CLINIC ----- ONE MONTH
- 11. GLUCOMA + OCCULAR PHYSIOTHERAPHY ----- ONE MONTH
- 12. GENERAL EYE O.T. ----- ONE MONTH

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TABLE-7

SUBJECT

BACHELOR OF OPTOMETRY

DISTRIBUTION OF MARKS FOR 3rd YEAR UNIVERSITY EXAM (TOTAL-500 MARKS)

MAIN SUBJECTS	THEORY Hrs & MARKS	IA THEORY + PRAC = TOTAL MARKS	PRACTICAL PAC+VIVA= TOTAL MARKS	TOTAL MARKS
(1) OCULAR DISEASES	3 hrs 70	20 + 10 = 30	Nil	100
(2) CONTACT LENS, OCULAR INJURY & EMERGENCY	3 hrs 70	20 + 10 = 30	40 + 10 = 50	150
(3) COMMUNITY OPHTHALMOLOGY, EYE BANK AND LOW VISION	3 hrs 70	20 + 10 = 30	40 + 10 = 50	150
TOTAL	210	90	100	400
<u>SUBSIDIARY SUBJECT</u>				
(1) OPHTHALMIC O.T MANAGEMENT	35	15	Nil	50
(2) HOSPITAL WASTE MANAGEMENT	35	15	Nil	50
TOTAL	70	30	---	100

MAIN SUBJECT+ SUBSIDIARY SUBJECT----- TOTAL 500 MARKS

CLINICAL POSTING

- 8. EYE OPD & INDOOR ----- TWO MONTH
- 9. REFRACTION ----- ONE MONTH
- 10. GENERAL EYE O.T. ----- ONE MONTH
- 11. RETINAL CLINIC ----- ONE MONTH
- 12. GLUCOMA + OCCULAR PHYSIOTHERAPY ----- ONE MONTH
- 13. COMMUNITY OPHTLAMOLOGY ----- ONE MONTH
- 14. EYE BANK ----- ONE MONTH

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TABLE-8

SUBJECT

BACHELOR OF OPTOMETRY

DISTRIBUTION OF MARKS FOR 4th Year CLINICAL INTERNSHIP + PROJECT WORK

MAIN SUBJECTS	IA*	VIVA TOTAL MARKS	TOTAL MARKS
(1) INTERNSHIP	Nil	50	50
(2) INTERNSHIP & RESEARCH PROJECT	150	Nil	150
TOTAL	150	50	200

CLINICAL INTERNSHIP + PROJECT WORK----- TOTAL 200

- Internship is for 12 months or 1 year. Total number of days (after deducting for national holidays & Sundays + Examination): 250 days (6 days / week; 6 hours / day) = 1500 hours or minimum of 18 weeks / semester (216 days).
- Project report (thesis) needs to be submitted during internship.

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BACHELOR OF OPTOMETRY **Ist YEAR**
Subject – ANATOMY (GENERAL & OCULAR)
THEORY (Paper – 1) F.M. – 70 (Hrs. – 3hrs)

1. Introduction of bones of the human body of :

- Upper Limb : Clavicle, Scapula, Humerus, Radius, Ulna, Carpal, Metacarpal and Phalanges
- Lower Limb : Hipbone, Femur, Tibia, Fibula, Tarsus, Metatarsus and Phalanges
- Skull : Name the bone of skull and sutures between them
- Thorax : Rib and their articulations
- Vertebral Column : Cervical, Thoracic, Lumbar, Sacral and Coccygeal vertebrae

2. Surface Marking of the Whole Body :

- Nine region of the abdomen
- Hip
- Skull

3. Introduction of different Vital Organs :

A) Respiratory organs :

- Nasopharynx
- Oropharynx
- Larynx
- Trachea
- Bronchi
- Lungs (and their lobular segments)
- Thoracic cavity
- Pleura and Pleural cavity

B) Circulatory Organs :

- Anatomical position of heart
- Pericardium of the heart
- Chamber of the heart
- Great vessels of the heart
- Valves of the heart

C) Digestive Organs :

- Tongue
- Teeth
- Oral cavity
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine

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D) Reproductive Organs :

- Introduction of male Genital Organs (Gonads) : Testes, Epididymis
- Introduction of female Genital Organs : Ovary, Fallopian Tube, Uterus, Vagina

E) Liver, Gall Blader and Spleen :

- Introduction
- Anatomical position

F) Excretory Organs :

- Cortex and Medulla of Kidney
- Ureter
- Urinary Bladder
- Urethra (male and female)

G) Muscles :

- Introduction, Origin, and Insertion, Function

H) Embryology

- Introduction

I) Endocrine Glands :

- Morphology and Anatomical relation
- Pituitary Gland
- Para Thyroid Gland
- Supra-renal Glands

J) Nervous System :

- Neuron Theory
- Classification of Nervous System
- Name of Basal membrane
- Blood supply of Brain
- Cranial Nerve
- Sympathetic and Parasympathetic System

K) Sense Organs :

- Skin – Histology, Epidermis and Dermis
- Ear
- Nose
- Tongue
- Eye :-
 - Morphology and Embryology
 - Parts of eye : Sclera, Cornea, Choroid, Ciliary body, Iris, Retina, Eyelid, Conjunctiva
 - Histology
 - Visual pathway and Optic nerve
 - Lachrymal apparatus
 - Extra ocular muscels and it's Nerve supply

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BACHELOR OF OPTOMETRY 1st YEAR
Subject – ANATOMY (GENERAL & OCULAR)
PRACTICAL (Paper – 1) (Only INTERNAL)

1. Labelled diagram of different organs and bones
2. Surface marking of the body
3. Demonstration of Histological Slide
 - a. Cartilage
 - b. Bone
 - c. Smooth Muscles
 - d. Skeletal Muscles
4. Radiography of Normal Bones, Joints and Chest
5. Eye: Practical dissection of bull's eye
6. Orbit: Practical demonstration of orbital structures

NO UNIVERSITY PRACTICAL EXAMINATION


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BACHELOR OF OPTOMETRY 1st YEAR
Subject – PHYSIOLOGY (GENERAL & OCULAR)
THEORY (Paper – 2) F.M. – 70 (Hrs. – 3hrs)

1. **Cell Biology :-** Cell membrane structure, intercellular organelles and their functions and cytoskeleton
 - Definition
 - Structure and functions the cytoplasmic organelles
 - Reproduction : Meiosis, Mitosis
2. **The important physio-chemical law applied to physiology**
 - Diffusion
 - Osmosis
 - Dialysis
3. **Fundamental of different Organ System**
 - Cardiovascular System
 - Respiratory System
 - Digestive System
 - Excretory System
 - Reproductive System
 - Endocrine System
 - Lymphatic System
4. **Blood**
 - Definition
 - Composition
 - Function
5. **Formation of different type of blood cells**
 - Erythrocytes
 - Leucocytes
 - Thrombocytes
6. **Mechanism of blood clotting**
7. **Cerebrospinal Fluid**
 - Formation and Circulation
 - Composition
 - Circulation and Function
8. **Kidney**
 - General introduction
 - Structure and Function
9. **Endocrine**
 - Secretion, Regulation and Function of Pituitary, Thyroid, Adrenal, Pancreas, Parathyroid, Testis and Ovaries


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10. Respiratory System

- Introduction, General Organization, Mechanics of respiration, Pulmonary volumes and capacities, Transport of respiratory Gases, Nervous and Chemical, Control of respiration, Pulmonary function test.

11. Cardiovascular System

- Structure and properties of cardiac muscle, Cardiac cycle, Regulation of heart rate, Cardiac output, Blood pressure, Its regulation, Regional circulation, Coronary, Cerebral Circulation, Cardio respiratory change during exercise, Normal ECG.

12. Physiology of Exercise

- Effect of acute and chronic exercise on Oxygen transport, B.M.R / R.Q / Body fluids and electrolytes.

13. Special Senses

- Hearing
- Taste
- Smell
- Sight : structure and functions of eye


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Subject – PHYSIOLOGY (GENERAL & OCULAR)
PRACTICAL (Paper – 2) (Only INTERNAL)

1. Labelled diagram of different Vital Organ & System
2. Labelled diagram of Corpuscles
3. Blood grouping Rh Typing
4. Determination of Vital Capacity
5. Auscultation of Heart Sound
6. Blood pressure Recording
7. Pulse rate, Heart rate
8. BMI

NO UNIVERSITY PRACTICAL EXAMINATION


Associate Prof. & HOD of Eye
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BACHELOR OF OPTOMETRY

1st YEAR

Subject – VISUAL OPTICS

THEORY (Paper – 3)

F.M. – 70

(Hrs. – 3hrs)

- 1. Introduction –Light, Mirror, Reflection, Refraction and Absorption**
- 2. Review of Geometrical Optics: Vergence and power**
 - Conjugacy, object space and image space
 - Sign convention
 - Spherical refracting surface
 - Spherical mirror; catoptric power
 - Cardinal points
 - Magnification
 - Light and visual function
- 3. Optics of Ocular Structure**
 - Cornea and aqueous
 - Crystalline lens
 - Vitreous
- 4. Measurements of Optical Constants of the Eye**
 - Corneal curvature and thickness
 - Curvature of the lens and ophthalmophakometry
 - Axial and axis of the eye
- 5. Basic Aspects of Vision**
 - Visual Acuity
 - Light and Dark Adaptation
 - Color Vision
 - Spatial and Temporal Resolution
 - Science of Measuring visual performance and application to Clinical Optometry


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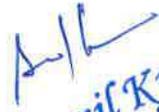
BACHELOR OF OPTOMETRY 1st YEAR
Subject – **VISUAL OPTICS**
PRACTICAL (Paper – 3) (Only INTERNAL)

1. Construction of a tabletop telescope – all three types of telescopes.
2. Construction of a tabletop microscope
3. Imaging by a cylindrical lens – relationship between cylinder axis and image orientation
4. Imaging by two cylinders in contact – determination of the position of CLC; verification of CLC using a spherical lens with power equal to the spherical equivalent; orientations and position of the line images and their relation to the cylinders' powers and orientations
5. Imaging by a spherocylindrical lens – sphere and cylinder in contact – determination of the position of CLC; verification of CLC using a spherical lens with power equal to the spherical equivalent; orientations and position of the line images and their relation to the cylinder's power and orientation

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BACHELOR OF OPTOMETRY **1st YEAR**
Subject – MICROBIOLOGY (GENERAL & OCULAR)
 THEORY (Paper – 4-a) F.M. – 35 (Hrs. – 1.5hrs)

COURSE CONTENTS :

- 1. Introduction and brief history of Microbiology**
 - Historical Aspect
 - Micro- Organism in Health and Disease
- 2. Requirement and uses of common Laboratory Equipments**
 - Incubator, Hot Air Oven, Water Bath
 - Anaerobic Jar, Centrifuge, Autoclave
 - Microscope
 - Glassware - Description of Glassware, its use, handling and care
- 3. Sterilization :**
 - Methods of Sterilization and it's Principle
 - Culture Media
- 4. Antiseptics & Disinfectants :**
 - Definition
 - Types
 - Mode of action
 - Uses
- 5. Collection, Transportation and processing of clinical samples for Microbiology, investigation**

COURSE CONTENTS

General Bacteriology

- Definition
- Morphology, Physiology and Classification of Bacteria
- Structure of Bacterial cell, Capsule, Flagella and Spores
- Growth of Bacteria and Nutrition of bacteria
- Staining Techniques used for Bacteriology
- Common bacterial infections of the eye.

Virology:

- Definition
- General Properties of Viruses
- Pathogenesis of Viral Infection
- Diseases caused by different Virus and mode of infection
- Common viral infections of the eye.


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Parasitology:

- Definition
- General description of Parasites and Host
- Classification of Parasite
- Mode of transmission of parasitic diseases
- Common parasitic infections of the eye

Fungus:

- Definition
- Structure
- Classification
- Common fungal infections of the eye


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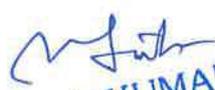

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BACHELOR OF OPTOMETRY 1st YEAR
Subject – MICROBIOLOGY (GENERAL & OCULAR)
PRACTICAL (Paper – 4-a) (Only INTERNAL)

1. Demonstration of washing of instruments
2. Staining - Type of Staining, Principle, Procedure and Interpretation
3. Culture - Urine, Blood, Body, Fluid, Water Stool, Swab
4. Types of media
5. Colony Characteristics
6. VDRL, ASO, CRP, WIDAL
7. Stool EXAMINATION
8. Microscopic Stool EXAMINATION

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BACHELOR OF OPTOMETRY 1st YEAR
Subject – BIOCHEMISTRY (GENERAL & OCULAR)
THEORY (Paper – 4-b) F.M. – 35 (Hrs. – 1.5hrs)

1. PHYSICAL BIOCHEMISTRY

1. Introduction of Biochemistry
2. Elementary knowledge of inorganic chemistry - Atomic weight, molecular weight, equivalent weight, acid, bases.
3. Definition and preparation of solutions - percent solution, Molar solution, Normal solution and Buffer Solution etc.
4. Definition and preparation of Reagent.
5. Unit of measurement
6. PH indicators: pH paper, universal and other indicators, pH measurement : different methods.
7. Ionization of water buffer PH value of solution using.

2. GENERAL BIOCHEMISTRY

1. Aim and scope of Biochemistry
2. Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation and disposal of Biological material.
3. Chemical EXAMINATION of urine Qualitative, Sugar, Protein, Bile Salt, Bile Pigment, Ketones Bodies
4. Chemical EXAMINATION of Stool :Occult Blood.
5. Chemical EXAMINATION of other Body fluids: CSF, Pleural Fluid, Ascitic Fluid etc.
6. Laboratory management and Maintenance of Records.

3. OCULAR BIOCHEMISTRY

1. Various aspects of the eye, viz., cornea, lens aqueous, vitreous, retina and pigment rhodopsin (The important chemicals in each and their roles).
Immunology of anterior segment.

INTRODUCTORY KNOWLEDGE OF:-

Carbohydrates:-

- Importance
- Classification
- Properties
- Estimation of Glucose
- Clinical Significance

Protein :-

- Introduction and Physiological importance
- Amino acids
- Essential amino acids
- Classification
- Denaturation of Proteins

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- Estimation of Total protein, albumin, Globulin, A/G Ratio

Lipids :-

- Definition and introduction of lipids
- Function of lipids
- Classification
- Clinical significance
- Steroids
- Estimation - total lipids, HDL, LDL, VLDL, Total cholesterol, Triglyceride

Electrolytes :-

- Function
- Properties
- Estimation of Essential electrolytes: Sodium, Potassium, calcium, chloride and phosphate etc.
- Clinical Importance

Liver Function Test (LFT) :-

- Introduction
- Function of liver
- Bile pigment
- Type of Jaundice
- Clinical significance

Kidney function tests (KFT):-

- Structure and function of Kidney
- Formation of urine
- Urea and Uric acid estimation

(3) ANALYTICAL BIO-CHEMISTRY

- Estimation of specific gravity of urine,
- Urinary proteins
- Blood sugar
- Blood urea
- Serum Creatinine
- Blood Cholesterol
- Serum Bilirubin, SGPT, SGOT,
- Alkaline Phosphatase
- Australia Antigen

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BACHELOR OF OPTOMETRY **1st YEAR**
Subject – BIOCHEMISTRY (GENERAL & OCULAR)
PRACTICAL (Paper – 4-b) (Only INTERNAL)

Introduction and usage of Glassware and Instruments.

Glassware :

- Composition of Glass
- General glass wares

Instruments :

- Balance
- Hot plate and Magnetic stirrer
- Centrifuges
- Incubators
- Constant temperature bath
- Colorimeter: Principle Function
- Photometer
- Flame Photometry
- Urine EXAMINATION Physical, Microscopic, Biochemical
- Stool EXAMINATION
- Body Fluids: Physical and chemical EXAMINATION CSF Pleural Fluid, Ascitic fluid.
- Methods of estimation of glucose: Benedicts Reaction, Glucose oxidase
- Methods of estimation of urea.
- Methods of estimation of creatinine.
- Methods of estimation of Cholesterol.
- Methods of estimation of Bilirubin.
- Methods of estimation of SCOT, SGPT

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BACHELOR OF OPTOMETRY **1st YEAR**
Subsidiary Subject – COMMUNICATIVE SKILLS (ENGLISH)
THEORY (Paper – 5-a) F.M. – 35 (Hrs. – 1.5hrs)

COURSE OUTLINE

COURSE DESCRIPTION : This course is designed to help the student acquire a good command and comprehension of the English language through individual papers and conferences.

BEHAVIOURAL OBJECTIVES :

The student at the end of training is able to

1. Read and comprehend English language.
2. Speak and write grammatically correct English.
3. Appreciates the value of English literature in personal and professional life.

UNIT -I: INTRODUCTION :

Study Techniques
 Organization of effective note taking and logical processes of analysis and synthesis
 use of the dictionary
 Enlargement of vocabulary
 Effective diction

UNIT-II: APPLIED GRAMMER :

Correct usage
 The structure of sentences
 The structure of paragraphs
 Enlargement of Vocabulary

UNIT- III: WRITTEN COMPOSITION :

Pracee writing and summarizing
 Writing of bibliography
 Enlargement of Vocabulary

UNIT-IV: READING AND COMPREHENSION :

Review of selected materials and express on self in one's words.
 Enlargement of Vocabulary

UNIT-V: THE STUDY OF THE VARIOUS FORMS OF COMPOSITION :

Paragraph, Essay, Letter, Summary Practice, in writing

UNIT-VI: VERBAL COMMUNICATION :

Discussions and summarization, Debater, Oral reports Use in teaching

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BACHELOR OF OPTOMETRY **1st YEAR**

Subsidiary Subject – COMPUTER SKILLS

THEORY (Paper – 5-b) F.M. – 35 (Hrs. – 1.5hrs)

&

PRACTICAL F.M – 15

Basic Computer Course (BBC)

1. Knowledge Computer :

➤ What is Computer, Basic Applications of Computer, Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

2. Operating Computer using GUI Based Operating System:

➤ What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts, Basics of O.S Setup; Common utilities.

3. Understanding Word Processing:

➤ Word Processing Basics; Opening and Closing of documents, Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

4. Using Spread Sheet:

➤ Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.


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BACHELOR OF OPTOMETRY

2nd YEAR

Subject :- OCULAR PHARMACY & PHARMACOLOGY

THEORY (Paper - 1)

F.M. - 70

(Hrs. - 3hrs)

1. OCULAR PHARMACOLOGY

1. Ocular Pharmacology (Introduction)
2. Autonomic Nervous System
3. Routes Of Drug Administration
4. Miotics, Mydriatic & Cycloplegic Drugs
5. Antibacterial Drugs & Therapy
6. Antifungal Drugs & Therapy
7. Antiviral Drugs & Therapy
8. Anti Inflammatory Drug & Therapy
9. Anti Glaucoma Drugs & Therapy
10. Ophthalmic Dyes
11. Local Anesthesia
12. Ophthalmic Preservatives
13. Ocular Lubricants
14. Ocular Irrigating Solutions
15. Ocular Antiseptic Agents
16. Anti-cataract Agents
17. Contact Lens Solution
18. Immunosuppressive agent
19. Anti VEGF Agent


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BACHELOR OF OPTOMETRY 2nd YEAR
Subject – OCULAR PHARMACY & PHARMACOLOGY
PRACTICAL (Paper – 1) (Only INTERNAL)

1. **Quality control**
 - Sterilization
 - PH measurement
 - Osmolarity
 - Spectrophotometer for concentration
2. **How to prepare following eye drops**
 - Pilo- clonidine eye drops
 - Artificial eye drops
 - Glycerine eye drops
 - Homatropine eye drops
 - EDTA eye drops
 - Sulphacetamide eye drops
 - DEXAMINATIONethasone eye drops
 - Methylecellulose eye drops
 - Saline eye drops
 - Sodium citrate eye drops
3. MK Media preparation
4. Fluorescein strip ,Rose Bengal strip preparation
5. Autologous serum eye drops preparation
6. Dilution of drug in different concentration
7. Steroid detection test

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BACHELOR OF OPTOMETRY **2nd YEAR**

Subject – OPTICS & REFRACTION, OPHTHALMIC INSTRUMENT & APPLIANCES
THEORY (Paper – 2) F.M. – 70 (Hrs. – 3)

OPTICS

1. Prisms –Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units, Sign Conventions, Fresnel’s prisms, rotary prisms
2. Prismatic effect, centration, decentration and Prentice rule, Prismatic effect of Planocylinder and Spherocylinderlenses
3. Lenses –Definition, units, terminology used to describe, form of lenses, Thin lens equation,thick lens equation, Determination focal length & diopter power, Neutralization of lens
4. Lenses surface i.e. spherical, cylindrical & toric surface,aspheric surface
5. Lens shape, size and types i.e. Spherical, cylindrical and Sphero-cylindrical
6. Vertex distance and vertex power, Effectivity calculations
7. Transpositions –Simple, Toric and Spherical equivalent
8. Spherometer & Sag formula, Edge thickness calculations
9. Magnification in high plus lenses, Minification in high minus lenses
10. Tilt induced power in spectacles
11. Aberration in Ophthalmic Lenses
12. principle of refraction
13. Strum’s conoid
14. Schematic eye
15. Correction of –
 - Myopia
 - Hypermetropia
 - Astigmatism
 - Aphakia / pseudo phakia
 - Presbyopia, keratoconus
 - Post Op refractive error
16. Accommodation & Presbyopia
 - Far and near point of accommodation
 - Range and amplitude of accommodation
 - Mechanism of accommodation
 - Variation of accommodation with age
 - Anomalies of accommodation
 - Presbyopia
 - Hypermetrop
17. Convergence:
 - Type, Measurement and Anomalies

➤ Relationship between accommodation and convergence-AC/A ratio

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18. Spectacle Lenses –

- Manufacture of glass
- Lens materials, Lens surfacing
- Principle of surface generation and glass cements
- Terminology used in Lens workshop
- Lens properties, Lens quality
- Faults in lens material, Faults on lens surface
- Methods of Inspecting the quality of lenses
- Safety standards for ophthalmic lenses (FDA, ANSI, ISI, Others)

19. Spectacle Frames:

- Types and parts
- Classification of spectacle frames-material, weight, temple position, Coloration
- Frame construction
- Frame selection
- Size, shape, mounting and field of view of ophthalmic lenses

20. Tinted & Protective Lenses

- Characteristics of tinted lenses Absorptive Glasses
- Polarizing Filters, Photochromic & Reflecting filters
- Safety lenses-Toughened lenses, Laminated Lenses, CR 39, Polycarbonate lenses

21. Multifocal Lenses:

- Introduction, history and development, types
- Bifocal lenses, Trifocal & Progressive addition lenses

22. Reflection from spectacle lens surface & lens coatings:

- Reflection from spectacle lenses - ghost images -Reflections in bifocals at the dividing line
- Antireflection coating, Mirror coating, Hard Multi Coating [HMC], Hydrophobic coating

23. Miscellaneous Spectacle:

- Iseikonic lenses
- Spectacle magnifiers
- Recumbent prisms
- Fresnel prism and lenses
- Lenticular & Aspherical lenses
- High Refractive index glasses

24. Special types of spectacle frames

- Monocles
- Ptosis crutches
- Industrial safety glasses
- Welding glasses
- Manufacturing spectacle lens

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26. Components of spectacle prescription & interpretation, transposition, Add and near power relation
27. Frame selection –based on spectacle prescription, professional requirements, age group, face shape
28. Measuring Inter-pupillary distance (IPD) for distance & near, bifocal height
29. Lens & Frame markings, Pupillary centers, bifocal heights, Progressive markings & adjustments –facial wrap, pantoscopic tilt
30. Recording and ordering of lenses (power, add, diameter, base, material, type, lens enhancements)
31. Neutralization –Hand & lensometer, axis marking, prism marking
32. Faults in spectacles (lens fitting, frame fitting, patients complaints, description, detection and correction)
33. Final checking & dispensing of spectacles to customers, counseling on wearing & maintaining of spectacles, Accessories –Bands, chains, boxes, slevets, cleaners, screwdriver kit
34. Workshop
35. Foci Meter
36. Test chart standard
37. Phoropter
38. Objective optometry
39. projection chats
40. Refraction room standard

REFRACTION

1. Emmetropia & Ametropia : Etiology, population, distribution, growth of eye
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/ pseudo phakia
6. Presbyopia
7. keratoconus
8. Post Op refractive error
9. Refraction of irregular reflex
10. Retinoscopy
11. **Objective Refraction (Static & Dynamic)**
 - Streak retinoscopy
 - Principle, Procedure, Difficulties and interpretation of findings
 - Transposition and spherical equivalent
 - Dynamic retinoscopy various methods
 - Radical retinoscopy and near retinoscopy
 - Cycloplegic refraction

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12. Subjective Refraction:

- Principle and fogging
- Fixed astigmatic dial(Clock dial),Combination of fixed and rotator dial(Fan and block test),J.C.C
- Duochrome test
 - Binocular balancing- alternate occlusion, prism dissociation, dissociate Duochrome balance, Borish dissociated fogging
 - Binocular refraction-Variou techniques

13. Cross cylinder

14. Paediatric Refraction

OPHTHALMIC INSTRUMENTS AND APPLIANCES

1. Ophthalmoscope : (Indirect and Direct)
2. Slit Lamp: (Haag streit & photo)
3. Lensometer : lens gauge
4. Tonometer : (Contact and Non contact)
5. Fundus camera
6. Auto refractometer
7. Corneal Examination -1: placido disc, keratometer, specular microscopy, Aesthesiometer, Pachymeter
8. Exophthalmometer
9. Perimeter - Manual &Automated
10. Orthoptics Instruments -Haploscope/Home devices
11. Heidelberg Retino tomography HRT- II
12. Nerve Fiber analyzer
13. OCT
14. Laser : (Yag and Green)
15. Frequency doubling perimeter
16. Ultra sound : (A-Scan and B-Scan)
17. Biometry
18. Contrast sensitivity test
19. Glare acuity test
20. Colour vision test
21. Dark adaptometer

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BACHELOR OF OPTOMETRY **2nd YEAR**

Subject – OPTICS & REFRACTION, OPHTHALMIC INSTRUMENT & APPLIANCES

PRACTICAL (Paper – 2) (UNIVERSITY PRACTICAL) F.M. – 40+10 = 50

OPTICS

1. workshop
2. Manufacturing spectacle lens
3. Manufacturing Bifocal lenses
4. Measurement for ordering spectacle, IPD, Marking centration, VD Calculation
5. Fitting Bifocal, multifocal, prism lenses
6. Fitting lenses in frame
7. Glazing & edging
8. Final checking, adjustment to prescription
9. Repair of Spectacle
10. Special type of spectacle monocell/ptosis hemianopic glasses
11. Neutralization of lenses
12. Focimeter
13. Shape of spectacle frame : Measurements & Marking, frame & face measurement
14. Refraction under the supervision

REFRACTION

- Refraction and prescription of glasses in OPD

OPHTHALMIC INSTRUMENTS AND APPLIANCES

1. Lensometer, lens gauge
2. Tonometer
3. Placido disc
4. Keratometer
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 test
14. Glare acuity test
15. Colour vision test
16. Dark adaptometer

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BACHELOR OF OPTOMETRY **2nd YEAR**
Subject – INVESTIGATIVE OPHTHALMOLOGY & ORTHOPTICS
THEORY (Paper – 3) F.M. – 70 (Hrs. – 3)

INVESTIGATIVE OPHTHALMOLOGY & ORTHOPTICS

1. Binocular Vision and Space perception.

- Relative subjective visual direction.
- Retino motor value
- Grades of BSV
- SMP and Cyclopean Eye
- Correspondence
- Fusion, Diplopia, Retinal rivalry
- Horopter
- Physiological Diplopia and Suppression
- Stereopsis, Panum’s area, BSV.
- Stereopsis and monocular clues - significance.
- Egocentric location, clinical applications.
- Theories of Binocular vision.

2. Anatomy of Extra Ocular Muscles.

- Rectii and Obliques, LPS.
- Innervation & Blood Supply.

3. Physiology of Ocular movements.

- Center of rotation, Axes of Fick.
- Action of individual muscle.

4. Laws of ocular motility

- Donders’s and Listing’s law
- Sherrington’s law
- Hering’s law

5. Uniocular & Binocular movements - fixation, saccadic & pursuits.

- Version & Vergence.
- Fixation & field of fixation

6. Near Vision Complex Accommodation

- Definition and mechanism (process).
- Methods of measurement.
- Stimulus and innervation.
- Types of accommodation.
- Anomalies of accommodation – aetiology and management.

7. Convergence

- Definition and mechanism.
- Methods of measurement.

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- Types and components of convergence - Tonic, accommodative, fusional, proximal.
- Anomalies of Convergence – aetiology and management.

8. Sensory adaptations

- Confusion

9. Suppression

- Investigations
- Management
- Blind spot syndrome

10. Abnormal Retinal Correspondence

- Investigation and management
- Blind spot syndrome

11. Eccentric Fixation

- Investigation and management

12. Amblyopia

- Classification
- Aetiology
- Investigation
- Management

13. Neuro-muscular anomalies

- Classification and etiological factors

14. History – recording and significance.

15. Convergent strabismus

- Accommodative convergent squint
 - Classification
 - Investigation and Management
- Non accommodative Convergent squint
 - Classification
 - Investigation and Management

16. Divergent Strabismus

- Classification
- A& V phenomenon
- Investigation and Management

17. Vertical strabismus

- Classification
- Investigation and Management

18. Paralytic Strabismus

- Acquired and Congenital
- Clinical Characteristics

19. Distinction from comitant and restrictive Squint

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20. Investigations

- History and symptoms
- Head Posture
- Diplopia Charting
- Hess chart
- Latent squint
- Maddox rod
- Maddox wing
- Synaptophore
- Testing of ARC
- Pleoptics
- PBCT
- Nine directions
- Binocular field of vision

21. Amblyopia and Treatment of Amblyopia

22. Paediatric Visual Acuity Assessment

23. AC/A ratio

24. Measurements of angle of squint

25. Nystagmus

- Non-surgical Management of Squint

26. Restrictive Strabismus

- Features
- Musculo-fascical anomalies
- Duane's Retraction syndrome
- Clinical features and management
- Brown's Superior oblique sheath syndrome
- Strabismus fixus
- Congenital muscle fibrosis

27. Surgical management

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BACHELOR OF OPTOMETRY **2nd YEAR**
Subject – INVESTIGATIVE OPHTHALMOLOGY & ORTHOPTICS
PRACTICAL (Paper –3) (UNIVERSITY PRACTICAL) F.M. – 40+10 = 50

INVESTIGATIVE OPHTHALMOLOGY

1. Manifest squint work up
2. Paralytic squint work up
3. pleoptics
4. Orthoptics Exercise

ORTHOPTICS

1. Latent squint work up
2. synptophore
3. Maddox wing
4. Maddox rods
5. prism bar
6. Near point of accomodation
7. Near point of convergence
8. Fusion exercise


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Basic Computer Course (BBC)

- 1. Communication using the internet**
 - Basic of computer networks
 - LAN, WAN
 - Concept of internet
 - Application of Internet
 - What is ISP
 - Knowledging the Internet
 - Basic of internet connectivity related troubleshooting
- 2. WWW and Web Browser**
 - World Wide Web
 - Web Browsing softwares
 - Search engines
 - Understanding URL
 - Domain name, IP address, Using e-governance website
- 3. Communication and Collaboration**
 - Basic of electronic mail
 - Getting an email account
 - Sending and receiving email
 - Accessing send emails
 - Using email
 - Document collaboration
 - Install messaging
 - netiquettes
- 4. Making small Presentation**
 - Basic of presentation software
 - Creating presentation / handouts

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BACHELOR OF OPTOMETRY 2nd YEAR
Subsidiary Subject :- PUBLIC HEALTH
THEORY (Paper - 4-b) F.M. - 20 (Hrs. - 1.5)
&
PRACTICAL F.M -15

1. Concepts health & disease
2. Basic in Epidemiology
3. Nutrition and Health
4. Environment and health
5. Communication in health
6. Demography and family planning with national population policy 2000
7. Essential medicine and rational use of drug
8. Health care delivery system with national health policy 2000
9. Health planning Management
10. Hospital waste management
11. Disaster management
12. National rural Health mission
13. National health programme in India

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BACHELOR OF OPTOMETRY **3rd YEAR**

Subject – OCULAR DISEASES

THEORY (Paper – 1) F.M. – 70 (Hrs. – 3)

OCULAR DISEASE

1. Orbit

- Proptosis
- Enophthalmos

2. Lids

- Styne
- Chalazion
- Blepharitis

3. Lacrimal System

- Dacryocystitis

4. Conjunctiva

- Conjunctivitis

5. Cornea

- Ulcer (Bacterial, Viral, Fungal)
- Keratoconus

6. Uvea

- Uveitis

7. Retina

- Retinal Detachment
- Retinal Hemorrhage
- Diabetic Retinopathy
- Hypertensive retinopathy
- Tuberculosis of eye

8. Vitreous

- Vitreous Hemorrhage
- Floaters

9. Lens

- Congenital Cataract
- Senile Cataract

10. Neuro-ophthalmology

- Papilledema
- Cranial Nerve Palsies

11. Glaucoma

- Open Angle
- Close Angle

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BACHELOR OF OPTOMETRY 3rd YEAR

Subject - OCULAR DISEASES

PRACTICAL (Only INTERNAL) (Paper - 1)

To assist in various operative procedure in OPD, OT and EMERGENCY

To attend in various ocular emergencies

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BACHELOR OF OPTOMETRY**3rd YEAR****Subject – CONTACT LENS , OCULAR INJURY & EMERGENCY**

THEORY (Paper – 2)

F.M. – 70

(Hrs. – 3)

CONTACT LENS

1. Introduction to Contact lenses
 - Definition
 - Classification / Types
2. Manufacturing Rigid and Soft Contact Lenses – various methods
3. RGP Contact Lens & SCL : Materials and Review of manufacturing techniques
4. Introduction to CL materials
 - Monomers, Polymers
5. Optics of Contact Lenses
 - Magnification & Visual field
 - Accommodation & Convergence
 - Back & Front Vertex Power / Vertex distance calculation
6. Review of Anatomy & Physiology of
 - Tear film
 - Cornea
 - Lids & Conjunctiva
7. Properties of CL materials
 - Physiological (Dk, Ionicity, Water content)
 - Physical (Elasticity, Tensile strength, Rigidity)
 - Optical (Transmission, Refractive index)
8. Indications and contraindications
9. Types of fit – Steep, Flat, Optimum –
 - on spherical cornea with spherical lenses
 - on Toric cornea with spherical lenses
 - Fit assessment in Soft Contact Lenses
10. Pre-Fitting Examination – steps, significance, recording of results
11. Checking and verifying Contact lenses from Laboratory
12. Modifications possible with Rigid lenses
13. Common Handling Instructions
 - Insertion & Removal Techniques
 - Do's and Dont's
14. Care and Maintenance of CL
 - Cleaning agents & Importance
 - Rinsing agents & Importance
 - Disinfecting agents & importance
 - Lubricating & Enzymatic cleaners
15. Follow up visit Examination
16. Comparison of RGP vs. SCL

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17. Parameters / Designs of Contact Lenses & Terminology
18. Complications of Contact lens wear
19. Fitting philosophies for CL
20. Calculation and finalising CL parameters
 - Disposable lenses
 - Advantages and availability
21. Soft Toric CL
 - Stabilization techniques
 - Parameter selection
 - Fitting assessment
22. Therapeutic contact lenses
 - Indications
 - Fitting consideration
23. Specialty fitting
 - Aphakia
 - Keratoconus
 - High Myopia
 - Pediatric
 - Post refractive surgery
24. Correction of Astigmatism with RGP lens
25. Management of Presbyopia with Contact lenses

OCULAR INJURY & EMERGENCY

Terminology : Closed globe injury (contusion, lamellar laceration), Open globe injury (rupture, laceration, penetrating injury, perforating injury)

1. Mechanical injuries (Extraocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis)
2. Non Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational)
3. Angle closer glaucoma
4. Acute Uveitis
5. Sudden loss of vision
6. Clinical approach towards ocular injury patients


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BACHELOR OF OPTOMETRY 3rd YEAR

Subject – CONTACT LENS , OCULAR INJURY & EMERGENCY

PRACTICAL (Paper – 2) (UNIVERSITY PRACTICAL) F.M. – 40+10 = 50

1. Measurement of Ocular dimensions
2. Pupillary diameter and lid characteristics
3. Blink rate and TBUT
4. Schrimers test, Slit lamp Examinationination of tear layer
5. Keratometry
6. Placido’s disc
7. Soft Contact Lens fitting – Aspherical
8. Soft Contact Lens fitting – Lathecut lenses
9. CL over refraction
10. Lens insertion and removal
11. Lens handling and cleaning
12. Examinationination of old CL
13. CL fitting
14. RGP Lens Fit Assessment and fluorescein pattern
15. Special RGP fitting (Aphakia, pseudo phakia & Keratoconus)
16. Slit lamp Examinationination of Contact Lens wearers
17. CL parameters
18. Fitting Cosmetic Contact Lens
19. Fitting Toric Contact Lens
20. Bandage Contact Lens
21. Specialty Contact Lens fitting

TO DO REGULAR OPD VISIT AND DUTIES

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BACHELOR OF OPTOMETRY**3rd YEAR****Subject – COMMUNITY OPHTHALMOLOGY, EYE BANK AND LOW VISION****THEORY (Paper – 3)****F.M. – 70****(Hrs. – 3)****A. COMMUNITY OPHTHALMOLOGY**

1. Public Health Optometry: Concepts and implementation, Stages of diseases
2. Dimensions, determinants and indicators of health
3. Levels of disease prevention and levels of health care patterns
4. Epidemiology of blindness – Defining blindness and visual impairment
5. Eye in primary health care
6. Contrasting between Clinical and community health programs
7. Community Eye Care Programs
8. Community based rehabilitation programs
9. Nutritional Blindness with reference to Vitamin A deficiency
10. Vision 2020: The Right to Sight
11. Screening for eye diseases
12. National and International health agencies, NPCB
13. Role of an optometrist in Public Health
14. Organization and Management of Eye Care Programs – Service Delivery models
15. Health manpower and planning & Health Economics
16. Evaluation and assessment of health programmes
17. Optometrists role in school eye health programmes
18. Basics of Tele Optometry and its application in Public Health
19. Information, Education and Communication for Eye Care programs

B. EYE BANK

1. Publicity
2. How to donate eye
3. Collection of eye
4. Preservation of eye
5. Pre & post operative instrument
6. Latest techniques for preservation of donor cornea

C. LOW VISION

1. Definitions & classification of Low vision
2. Epidemiology of low vision
3. Model of low vision service
4. Pre-clinical evaluation of low vision patients – prognostic & psychological factors; psychosocial impact of low vision
5. Types of low vision aids – optical aids, non-optical aids & electronic devices
6. Optics of low vision aids
7. Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction & training

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- 8. Pediatric Low Vision care
- 9. Low vision aids – dispensing & prescribing aspects
- 10. Visual rehabilitation & counseling
- 11. Legal aspects of Low vision in India
- 12. Case Analysis
- 13. The success of visual aids


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BACHELOR OF OPTOMETRY **3rd YEAR**

Subject – COMMUNITY OPHTHALMOLOGY, EYE BANK AND LOW VISION
PRACTICAL (Paper – 3) (UNIVERSITY PRACTICAL) F.M. – 40+10 = 50

1. To visit eye bank to collect various data and Counseling the patient
2. To attend community Ophthalmic camp
3. To attend Cataract camp
4. Attending in low vision care clinic and history taking.
5. Determining the type of telescope and its magnification (Direct comparison method & calculated method)
6. Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.
7. Inducing visual impairment and prescribing magnification.
8. Determining reading speed with different types of low vision aids with same magnification.
9. Determining reading speed with a low vision aid of different magnifications


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BACHELOR OF OPTOMETRY **3rd YEAR**
Subsidiary Subject – OPTHALMIC O.T MANAGEMENT
THEORY (Paper – 4-a) **F.M. – 35** (**Hrs. – 1.5hrs**)

A. OPTHALMIC O.T MANAGEMENT

1. Introduction To Ocular In General O.T Management
2. Asepsis how to achieve
3. Anesthetic agent and where indicated
4. O.T Sterilization procedure
5. Sterilization procedures of 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 equipments

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BACHELOR OF OPTOMETRY **3rd YEAR**
Subsidiary Subject – HOSPITAL WASTE MANAGEMENT
THEORY (Paper – 4-b) F.M. – 35 (Hrs. – 1.5hrs)

B. HOSPITAL WASTE MANAGEMENT

1. Introduction To Biomedical Waste
2. Classification And Categories Of Hospital Wastes
3. Routes Of Transmission Of Disease By Biomedical Waste
4. Safety Measures
5. The Laws Regarding Biomedical Waste Treatment
6. Collection And Segregation Of Biomedical Wastes
7. Transportation And Segregation Of Biomedical Wastes
8. Disposable Techniques
9. Awareness And Education
10. Persons At Risk, Rag Pickers

NO UNIVERSITY PRACTICAL EXAMINATION


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BACHELOR OF OPTOMETRY 4th YEAR

Subject - INTERNSHIP

Paper - 1 (Only INTERNAL) F.M. - 50

1. RETINA
2. GLAUCOMA
3. LOW VISION
4. REFRACTION AND HISTORY TAKING
5. ANTERIOR SEGMENT EXAMINATION AND DISEASES
6. POSTERIOR SEGMENT EXAMINATION AND DISEASES
7. PEDIATRIC & BINOCULAR VISION
8. CORNEA & CONTACT LENS AND SPECIALIZED ADVANCE FITTINGS
9. PRIMARY EYE CARE
10. COMPREHENSIVE EYE CARE & REFRACTION
11. OPTOMETRIC PROCEDURES & INSTRUMENTS

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BACHELOR OF OPTOMETRY **4th YEAR**

Subject - INTERNSHIP & RESEARCH PROJECT

Paper - 2 (Only INTERNAL) F.M. - 150

1. RETINA
2. GLAUCOMA
3. LOW VISION
4. REFRACTION AND HISTORY TAKING
5. ANTERIOR SEGMENT EXAMINATION AND DISEASES
6. POSTERIOR SEGMENT EXAMINATION AND DISEASES
7. PEDIATRIC & BINOCULAR VISION
8. CORNEA & CONTACT LENS AND SPECIALIZED ADVANCE FITTINGS
9. PRIMARY EYE CARE
10. COMPREHENSIVE EYE CARE & REFRACTION
11. OPTOMETRIC PROCEDURES & INSTRUMENTS

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Total Internship: - 1 YEAR (12 months)

Placement

Indoor / Outdoor Total Months

Total Hrs

1] Refraction and history taking ----- - 3 months

(435hrs)

- a) General work-up and history taking
- b) Wet and Dry Retinoscopy

2] Contact Lens and Specialized Advance Fittings -----1 month

(145 hrs)

- a) Work-up and instrumentation
- b) Soft contact lens Fittings
- c) Rigid gas permeable lens fittings
- d) Specialized Contact lens fittings

3] Orthoptics and Binocular Vision----- 1 month

(145hrs)

- a) Preliminary Examination and Work-up
- b) Synaptophore and other instruments
- c) Amblyopia & Anti-suppression therapy

4] Low Vision Subjects and Aids ----- 1 month

(145 hrs)

- a) Low vision work-up and history training
- b) Assessment and Hands on Training

5] Anterior Segment Examination and Diseases-----3 months

(435hrs)

- a) Preliminary Examination, Work-up, History
- b) Slit lamp and other instruments
- c) Cornea, Conjunctiva, Anterior segment diseases

6] Posterior Segment Examination and Diseases-----2 months

(300 hrs)

- a) Preliminary Examination, Work-up, History
- b) Slit lamp, Ophthalmoscope and other instruments
- c) Vitreous, Retina, Posterior segment diseases

7] Community ophthalmology-----1 months

(145hrs)

[Includes Project on evidence based investigation measures or Clinical trials/

Prospective case studies having sample size of minimum 50 Subjects.]

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Skills based outcomes and monitorable indicators for Optometrist

SEMINARS : ALL STUDENTS HAVE TO ATTEND SEMINARS & CME

First year:

1. Role play
2. Clinical Observations
3. Vision Check
4. Basic Lensometry

Second year:

1. History taking
2. CEVS practical
3. Refraction Hands On including optical dispensing
4. Clinical Observations
5. Vision screening camps

Third year:

1. Clinical Observation
2. Hands-on under senior optometrists
3. Case reporting
4. Case discussion
5. Vision screening camps
6. Diagnostic interpretations

Internship:

1. Primary Eye Care 25 %
2. Dispensing Optics 25 %
3. Contact Lens 10%
4. Low Vision Aids 10%
5. Orthoptics 10%
6. Diagnostics 10 %
7. Anterior Segment clinic 5%
8. Posterior Segment Clinic 5%

YEAR	PROCEDURES	MINIMUM NUMBER	COMMENTS
1 st YEAR CLINIC	Role Play (Patient-Optometrist)	3 cases	
	Clinical Observation	6 cases	
	Vision Check (Snellen's Chart) – Distance + Near	12 cases	
	Lensometry (Spherical lenses)		

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YEAR	PROCEDURES	MINIMUM NUMBER	COMMENTS
2 nd YEAR CLINIC	History taking - General - Specific - Conditions	9 cases	Can practice on the following complaints : Blurred Vision, Headache, Pain, redness, Watering, Flashes, Floaters, Blackspots
	Lensometry	100 cases	Simple Sphere, Simple cylinder, Spherocylinder (90, 180, Oblique degrees), Bifocals, PAL
	Vision Check (log MAR) Pinhole acuity	100 cases	Simulation, especially to show and ask the students to interpret the findings.
	Extraocular Motility	10 cases	
	Cover test	10 cases	Video output Simulation of various conditions
	Alternate Cover test	10 cases	Video output Simulation of various conditions
	Hirschberg test	10 cases	Video output Simulation of various conditions
	Modified Krimsky test	3 cases	Video output Simulation of various conditions
	Push up test (Amplitude of Accommodation)	10 cases (1case in presbyopic age)	
	Push up test (Near point of Convergence)	10 cases	

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2nd YEAR CLINIC

Stereopsis test	10 cases	
Tear Break up time	10 cases	
Amsler's Grid test	10 cases (simulate)	Simulation of various conditions
Photostress test	10 cases (Normal)	
Color vision test	10 cases	
Schirmer's test	10 cases	
Confrontation test	10 cases	
Slit lamp illumination	3 cases	
Slit lamp examination	10 cases	
Finger tension	10 cases (Normal)	
Schiotz Tonometry	10 cases (Normal)	
Applanation Tonometry	10 cases (Normal)	
Negative Relative Accommodation	10 cases	
Positive Relative Accommodation	10 cases	
von Herick Grading of Anterior chamber depth	10 cases	
Accommodative facility(+ 2.00 D)	10 cases	
Corneal Sensitivity test	10 cases	
IPD	10 cases	
Proptosis evaluation	1 demo	Video demonstration of cases
Ptosis evaluation	1 demo	Video demonstration of cases
Pupillary evaluation -Direct -Consensual -RAPD	10 cases	
HVID	10 cases	
Maddox rod (Phoria)	10 cases	
Negative Fusional vergence	10 cases	
Positive Fusional Vergence	10 Cases	

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	Retinoscopy -Static, Dynamic and Cycloplegic Retinoscopy	25 + 25 + 25 cases	Model eye for retinoscopy.
	Keratometry	25 cases	
	Subjective Refraction JCC Clock Dial Duochrome Borish Delayed Give more simulated problems and discuss on it	25 cases	
3 rd YEAR CLINIC	Direct ophthalmoscope	10 cases (Normal)	Show slides of various commonly seen retinal conditions
	Visual Field chart interpretation	10 cases discussion	Both kinetic and Static
	B scan Interpretation	10 cases discussion	
	A scan chart Interpretation	10 cases discussion	Discussion having different types of wave patterns
	Case Analysis	10 cases	
	+90 D lens	10 cases (Normal)	Slides of various Cup: Disc ratios can be shown
	Gonioscopy	5 cases (Normal)	Slides of abnormal angles
	Posting in optometry clinics	5 + 5 + 5 + 5 + 10 cases	Pediatric/contact lens/Low vision/ Orthoptics/ GOPD
	Camps	4 camp	School screening, Cataract
	IDO (on each other)	10 cases (Normal)	Slides of abnormal fundus
Case Analysis -	5 + 5 + 5 + 5 Cases	Pathology Binocular Vision Clinical Refraction Dispensing optics	

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YEAR	Procedures	Minimum Number	Comments
4 th YEAR CLINIC	General OPD (History taking -DO)	500 cases	Weekly 1 case report submission
	Contact Lens	20 cases (5 RGP + 5 soft + 5 toric)	Totally 3 different case reports submission at the end of the postings
	Opticals	100 cases	Weekly 1 case report submission
	Low Vision care Clinic	10 cases	Totally 3 different case reports submission at the end of the postings
	Binocular Vision clinic	10 cases	Totally 3 different case reports submission at the end of the postings
	Ophthalmology clinic (Common eye conditions)	50 cases	Totally 3 different case reports submission at the end of the postings
	Camps	10 camps	Camp report submission


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