
**CURRICULUM FOR 4 YEARS DEGREE PROGRAMME
IN OPTOMETRY & ORTHOPTICS (B.Sc HONS)**



**UNIVERSITY OF HEALTH SCIENCES
LAHORE, PAKISTAN**

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



GOVERNOR

GOVERNOR'S HOUSE,
LAHORE

FOREWORD

1. The establishment of University of Health Sciences is a milestone in the efforts of the Government to ensure quality medical education in the province. The Government of Punjab has achieved tremendous progress in providing quality education with the establishment of this University.
2. With a view of bringing further improvement in medical education, the undergraduate programmes are being reviewed continuously to improve their quality and to bring them at par with international standards.
3. The Government has focused on other components relating to health sciences and has particularly been successful in bringing about a significant improvement in the field of pharmacy. In addition, the Government of Punjab has undertaken a new initiative by introducing a four-year degree programme in Allied Health Sciences. Considering the rapid technological developments in health systems worldwide. The Health Sciences programme is a step forward, filling the gap in the prevailing health systems in the province.
4. I am happy to point out that all medical colleges affiliated with the University of Health Sciences have unanimously been able to put up a comprehensive programme covering 17 disciplines in the Allied Health Sciences. This indeed, is a very positive, appreciative and commendable effort.
5. I wish them success in their endeavours.

T. GEN. (R) KHALID MAQBOOL

H.I., H.I.(M)



UNIVERSITY OF HEALTH SCIENCES LAHORE

Vice chancellor

PREFACE

A university is the zenith of knowledge that imparts quality education and awards degrees for extensive educational attainments in various disciplines. Protection of traditional knowledge, making exploration about it and obtaining deep understanding about modern technology and research techniques are some of responsibilities of the university. The mission of University of Health Sciences Lahore (UHS) is chartered to develop an intellectually conducive environment providing excellence and innovation in medical education and research to produce competent and community-oriented doctors, dentists, nurses, bio-medical engineers, and paramedics.

Allied Health Sciences is a field in medicine that has been completely neglected up till now so that there is an absolute dearth of trained Allied Health personnel who are the actual service providers to the patients. As a matter of fact they form the connecting link between the doctors and the patients which is missing altogether in our health care system.

Realizing all this UHS Lahore for the first time took the lead to organize education and training at B.Sc Honors level in all disciplines of Allied Health Sciences. Fifteen disciplines have been identified in which these programmes are launched in all the UHS-affiliated medical institutions in both public and private sectors. These programmes include; Medical Laboratory Technology, Medical Imaging Technology, Emergency & Intensive Care, Physiotherapy, Optometry and Orthoptics, Orthotic and Prosthetic Sciences, Respiratory Therapy, Cardiac Perfusion, Dental Technology, Occupational Therapy, Speech & Language Pathology , Operation Theater Technology, Nutrition, Audiology and Biomedical Engineering. This is going to be a remarkable development in the field of medicine in our country and will fill up the existing gaps in the health delivery system.

All this has been achieved with constant support and guidance of Honorable Chancellor / Governor of the Punjab Lt. Gen. (Retd.) Khalid Maqbool who has actually played a pivotal role in organizing these programmes. Government of the Punjab in the Health Department is fully committed to support this educational programme and has instructed all the medical institutions under its administrative control to launch these programmes in their respective institutions.

This document precisely briefs the details of B.Sc Programme in Optometry and Orthoptics as prepared by the experts' committee. I am pleased to acknowledge the efforts made by Dr. I. A. Naveed, Dr. Asad Zaheer, Dr. Asim Mumtaz, Dr. Junaid Sarfraz Khan, Dr. Obaidullah Shakir (CH& ICH), Dr. Nadia Naseem and the members of committee consisting of Professor Wajid Ali Khan (Al-Shifa Trust Eye Hospital) and Professor Imran Aslam (PGMI, Lahore). The contribution made by them will go a long way in the education and training in the field of AHS.

I hope this programme will meet the latest trends in Optometry and Orthoptics and will certainly produce competent paramedical personnel to fill in the gap in the system which is main objective of this programme.

Prof. M. H. Mubbashar

Hilal-e-Imtiaz, Sitara-e-Imtiaz

MB, FRCP, FCPS Psych, FRC Psych, DPM

Vice Chancellor/ Chief Executive

University of Health Sciences, Lahore

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AIMS AND OBJECTIVES OF THE COURSE

AIMS:

The aim of the 4 years degree programme in Optometry and Orthoptics is to equip the students with relevant professional knowledge, skills, techniques and ethical values to enable them to apply their acquired expertise at a level between the doctors and the patient for efficient health service delivery.

GENERAL LEARNING OBJECTIVES:

Optometry and Orthoptics education and training should enable the student to:

- Develop accuracy and meticulousness to attain high ethics and technical proficiency levels.
- Assess the technical and non-technical skills in a standardized and reproducible environment.
- Strengthen the decision power and exercise appropriate judgment skills, to be applied especially during a crisis.
- Develop good leadership, problem-solving and administrative skills.
- Develop and analyze innovative strategies for effective communication with the patients and the healthcare personnel.
- Demonstrate interdisciplinary team-building strategies for effective coordination between various Allied Health Disciplines.
- Demonstrate understanding of the basic concepts of professional Behaviour and legal implications of the work environment.
- Demonstrate knowledge of his / her role in the health care delivery system.
- Establish and maintain continuing education as a function of growth and maintenance of professional competence.

SPECIFIC LEARNING OUTCOMES

Following competencies will be expected from a student completing 4 years degree course in Optometry and Orthoptics. The student should be able:

- To obtain upto date knowledge of functions of recent advances in Optometry and Orthoptics.
- To alienate the shortage of trained Ophthalmic Midlevel Personnel and to focus on Human Resource Development.
- To provide clinical attachment for trained Ophthalmic Midlevel Professionals in the country's private and public sector hospitals.
- To establish Institutionalized training in the field of Optometry and Orthoptics at par with the international level.
- To collaborate internationally with well-recognized Institutions in respective disciplines to develop the program and postgraduate fellowship training in Optometry and Orthoptics.
- To ultimately establish an institute of Optometry and Orthoptics.

NOMENCLATURE AND DURATION

NOMENCLATURE:

The name of the degree programme shall be B.Sc Optometry and Orthoptics. The duration of the course shall be 4 years with structured training in a recognised department under a supervisor.

COURSE TITLE:

B.Sc Optometry and Orthoptics

TRAINING CENTERS:

Departments of Ophthalmology accredited by UHS for this training in the affiliated institutes of the University of Health Sciences, Lahore.

COURSE DURATION:

Four years of structured training in a recognised department under the guidance of a supervisor.

COURSE SCHEME:

The training is spread over four years, with a specific component for each year of training.

	Theoretical component	Practical component
FIRST YEAR	<ol style="list-style-type: none"> 1. Basic Anatomy 2. Basic Physiology 3. Basic Biochemistry 4. General Pathology 5. Behavioural Sciences 6. Islamiyat 7. Pakistan studies 8. Computer Education 	Hand-on training in basic techniques related to the discipline.
SECOND YEAR	<ol style="list-style-type: none"> 1. Ophthalmic Anatomy and Physiology 2. Physiological and Visual Optics 3. Physical, Geometrical and Instrument Optics 4. Orthoptics, Squint and Low Vision 	Hands-on training in Optometry and Orthoptics techniques
THIRD YEAR	<ol style="list-style-type: none"> 1. Ophthalmic Dispensing and Contact Lenses 2. Ophthalmic Diseases and Pharmacology 3. Occupational Optometry and Preventive Ophthalmology 4. Clinical Optometry and Examination 	Hand-on rotational training in Optometry and Orthoptics techniques
FOURTH YEAR	<ol style="list-style-type: none"> 1. Pediatric Optometry 2. Ophthalmic Instrumentation 3. Biostatistics And Research Methodology 	Advanced Training of Pediatric Optometry, Outreach and School Screening, and Diagnostic equipment research project

ELIGIBILITY CRITERIA FOR ADMISSION:

DOCUMENTS REQUIRED FOR ADMISSION:

- Completed B.Sc Optometry and Orthoptics application form
- Copy of the Matriculation Certificate
- Copy of the F.Sc Premedical/ Equivalent examination Certificate with detailed marks sheet
- Copy of the entry test result card
- 3 passport size photographs

GENERAL REQUIREMENTS:

- Securing pass percentage in the entry test.
- Qualifying for the interview successfully.
- Having up to the mark's credentials (No. of attempts, any medal or distinction).

REGISTRATION AND ENROLLMENT:

- The total number of students enrolled must not exceed 10 per department.
- UHS will approve supervisors for the course.
- Candidates selected will be registered with the approved supervisor and enrolled with UHS.

RECOGNITION / EQUIVALENCE OF THE DEGREE AND THE INSTITUTION

After four years of training and education, the candidates, on successful completion of the course, will be awarded a graduate degree in Allied Health Sciences by the UHS, equivalent to any other similar qualifications.

ACCREDITATIONS OF THE TRAINING INSTITUTION:

The relevant department of an affiliated institute will get accreditation for the training programme based on the following:

- **Faculty:** properly qualified and trained faculty for the programme's education.
- **Adequate space:** including classrooms with audiovisual aids, Computer labs, and properly equipped laboratories related to the discipline.
- **Library:** Departmental library should have the latest editions of the recommended books, reference books and Journals related to the specialty.

METHODS OF INSTRUCTIONS

As a policy, active participation of the students will be encouraged. The following teaching modalities will be employed:

- Large group teachings (lectures)
- Small group teachings
- Seminar presentations
- Assignments
- Skills teachings

- Self-study and use of the internet.

In addition, to promote interactive and communication skills, the following methods will be used.

MONTHLY STUDENTS' MEETINGS:

- Journal club meeting
- Core curriculum meeting
- Skill development

ANNUAL GRAND MEETING:

Once a year, all students enrolled at UHS from different institutes will be invited to the annual meeting at UHS. The students will present their annual reports. Issues and concerns related to each discipline will be discussed. Feedback should be collected, and suggestions should be sought to involve students in decision-making. Any research or literary work done by the students will be displayed.

In the evening, an informal dinner and gathering can be arranged. This will help create a sense of belonging and ownership among the students and the faculty.

QUALITY ASSURANCE IN EDUCATION

Quality assurance in health education is a broad spectrum of plans, policies, and procedures that provides a baseline structure to achieve quality goals. Quality planning, quality improvement, and quality assessment are the main areas of quality assurance that need thorough intervention based on professional concepts. It is the sum of assessing and stimulating health education quality by measuring outcome and comparing it with current criteria and healthcare demands. Quality assurance should ensure that activities of health education are systematic and controlled. It should affect all levels of the health community and every professional working in health care.

Guidelines For Regional and International Standards:

- Mission and Objectives
- Educational Programme
- Assessment of Students
- Student Education and Support
- Academic Staff
- Educational Resources
- Governance and Administration
- Continuous Renewal

This educational programme has been designed and carried out strictly based on the above-mentioned guidelines.

SKILLS TO BE LEARNT DURING OPTOMETRY & ORTHOPTICS

1. To Perform Refraction
2. To Dispense glasses
4. To be able to do a proper referral to an Ophthalmologist
5. To do a Low vision assessment
6. To Dispense low-vision devices
7. To provide training in using Low Vision Devices
8. To dispense contact lenses and be able to manage these patients
9. To be able to perform Diagnostic tests, i.e. Visual Fields, Tangent Screen, Hess's
10. To do a Vision assessment of Infants and children.
11. To perform refractions in children
12. To do Orthoptics / Squint assessment
13. To follow the plan of surgical squint correction

EQUIPMENTS

As Per Ophthalmology Units of The Accredited Hospitals

- Professional Ophthalmoscope
- Professional Retinoscope
- Streak Retinoscope
- Photo Slit Lamp
- Variable Angle Retinal Camera
- Lens Set
- Spectacles /Glasses Mirror lens
- Trans Equator Lens
- Ocular Science type lens
- Cross Cylinder Set (0.25, 0.50, 0.75, 1.00)
- Prism Bar Set: horizontal & vertical
- Set of Trial frames
- Trial Frame for Children/Kids:
- Direct Ophthalmoscope
- Pin-hole Occluder
- Set of Optical Pliers
- Vision testing room
- Optometry and orthoptic laboratory
- Well-equipped room for surgical maneuver

EXAMINATIONS

ASSESSMENT:

It will consist of action and the professional growth-oriented student-centred integrated assessment, with additional components of the internal assessment formative assessment measurement-based summative assessment.

STUDENT-CENTERED AND INTEGRATED ASSESSMENT.

It views students as decision-makers in need of information about their performance. Integrated assessment is meant for students' responsibility to decide what to evaluate and how to evaluate; it encourages students to "own" the evaluation and use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualised, flexible and action-oriented.

It will be based on,

- Self-assessment by the students
- Peer assessment
- Internal assessment by the faculty

SELF-ASSESSMENT BY THE STUDENTS:

Each student will be provided with a predesigned self-assessment form to evaluate his/her level of comfort and competency in dealing with different education-related situations. The student will be responsible for correctly identifying his/her areas of weakness and taking appropriate measures to address these weaknesses.

PEER ASSESSMENT:

After the monthly small group meetings, the students will be expected to evaluate their peers. These should be followed by constructive feedback according to the prescribed guidelines and should be non-judgmental. This will enable students to become good mentors in the future.

INTERNAL ASSESSMENT BY THE FACULTY:

The students are encouraged to confront their weaknesses and remove them rather than hide those from their teachers. It will be based on the following:

- Punctuality
- Practical work
- Participation in interactive sessions
- Regularly conducted class tests

FORMATIVE ASSESSMENT:

This will help improve the existing instructional methods and course contents in use. This will be done through a predesigned form filled in by the students.

SUMMATIVE ASSESSMENT:

It will be carried out at the end of the programme to empirically evaluate the cognitive, psychomotor and effective domains to award the degree after successfully completing the course.

ELIGIBILITY TO APPEAR IN THE FINAL EXAMINATIONS

- Only those students who have completed four years of structured and supervised training and have passed the 1st, 2nd and 3rd professional examinations will be eligible to take the final exams.
- 75% of the attendance with a certificate of recommendation from the supervisor/ Head of the department/ Institution.
- Application for admission to the university exam duly recommended by the Head of the Institution.

UHS will appoint a panel of two examiners, one internal and one external to conduct the practical and the viva voce exam. Each component of the practical exam will be assessed by both the examiners awarding marks independently. The final score will be an average of both scores.

PASS PERCENTAGE AND OTHER REGULATIONS REGARDING EXAMS.

- 50% will be a passing score in each component.
- The candidates must pass each component separately.
- The candidate failing in one component will reappear in the same component again.
- The candidate must pass the 1st, 2nd and 3rd professional examinations in a maximum of 3 attempts.
- The final examination will be cleared in a maximum of 4 attempts.
- Only those candidates who will be allowed to take the practical and the oral exam who pass the theory exam.
- The results will be announced as per UHS rules and regulations.

APPENDIX: A: OUTLINE OF PROFESSIONAL EXAMINATIONS

FIRST PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

PAPER	SUBJECTS	THEORY MARKS	INTERNAL ASSESSMENT	TOTAL MARKS
Paper-I	Basic Anatomy & Physiology	90	10= 5 + 5 marks for each subject	100
Paper-II	Basic Biochemistry & General Pathology	90	10= 5 + 5 marks for each subject	100
Paper-III	Islamic Behavioural Sciences & Computer Education	90	10= 5 + 5 marks for each subject	100
Paper-IV	<i>Islamic studies / Ethics & Pakistan Studies</i>	90	<i>Islamic Studies/Ethics 6 marks Pakistan Studies 4 marks</i>	100*
Pass Marks= 50%			Total Marks = 300	
*OSPE-Short case/ Long case				
* <i>Pakistan studies & Islamic studies/Ethics marks are not included in total marks</i>				

OUTLINE FIRST PROFESSIONAL EXAMINATION

The First Professional examination shall be held at the end of the first academic year (nine months of teaching). Every candidate shall be required to take the examination in the following subjects. A candidate to pass a subject shall have to obtain a minimum of 50% of the total marks of each part of the subject separately. The minimum marks required to pass the Islamic Studies/Ethics & Pakistan Studies examination is thirty-three percent (33%) in each paper separately and thirty-three percent (33%) in aggregate.

Paper-I Basic Anatomy & Physiology = 100 marks

The subject of the Basic Anatomy & Physiology examination shall consist of one Theory Paper of three hours duration and a maximum of 90 marks. Internal Assessment will be of 10 marks. The syllabus to be covered is mentioned in Appendix "B".

Section I: Basic Anatomy = 50 Marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section-II: Basic Physiology = 50 marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Paper-II: Basic Biochemistry & General Pathology = 100 marks

The examination in the subject of Basic Biochemistry & General Pathology shall consist of one Theory Paper of three hours and a maximum of 90 marks. Internal Assessment will be of 10 marks. There will be two sections in this paper.

Section I: Basic Biochemistry = 50marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: General Pathology = 50 marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Paper-III: Islamic Studies / Ethics & Pakistan Studies =100 marks

The examination shall consist of one Theory Paper of 60+40=100 marks and 3 hours duration. The syllabus to be covered is mentioned in Appendix "B".

Section I: Islamic Studies/Ethics =60 marks.

This section shall have a question on Islamic Studies in the case of Muslim candidates and on ethics in the case of non-Muslims. There shall be 3 questions in this theory section, and there will be no choice. Each question shall carry 18 marks. Internal assessment will be of 06 marks.

Section II: Pakistan Studies = 40 marks

This section shall have 3 questions on Pakistan Studies, and there will be no choice. Each question shall carry 12 marks. Internal assessment will be of 04 marks.

Paper-IV: Behavioural Sciences & Computer Education= 100 marks

The examination in the Behavioural Sciences & Computer Education paper shall consist of one Theory Paper of 90 marks and three hours duration. Internal Assessment will be of 10 marks. The syllabus to be covered is mentioned in Appendix “B”.

Section I: Behavioural Sciences = 50 marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: Computer Education = 50 marks

There will be 45 MCQs, and each question will carry 1 mark. Internal assessment will be of 05 marks.

SECOND PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

PAPER	SUBJECTS	THEORY MARKS	PRACTICAL MARKS*	TOTAL MARKS
Paper-I	Ophthalmic Anatomy and Physiology	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-II	Physiological and Visual Optics	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-III	Physical, Geometrical and Instrument Optics	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-IV	Orthoptics, Squint and Low Vision	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Pass Marks= 50%			Total Marks = 800	
*OSPE-Short case/ Long case				

OUTLINE OF SECOND PROFESSIONAL EXAMINATION

The Second Professional Examination shall be held at the end of the second. It shall consist of the following subjects: The syllabus details are outlined in Appendix B.

Paper-I: Ophthalmic Anatomy and Physiology

Theory:

The examination in the subject of Ophthalmic Anatomy and Physiology shall consist of one Theory Paper of three hours duration and a maximum of 90 marks. Internal Assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of two sections, as detailed below.

Section I: Ophthalmic Anatomy = 50 marks

There will be 05 short essay questions for Ophthalmic Anatomy, and there will be no choice. Each short essay question will carry 05 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal Assessment will be of 5 marks.

Section II: Ophthalmic Physiology = 50 marks

There will be 05 short essay questions about Ophthalmic Physiology, and there will be no choice. Each short essay question will carry 05 marks.

There will be 20 MCQs, and each question will carry 1 mark.

The internal assessment will be of 5 marks.

Oral/ Practical Examination in the subject of Ophthalmic Anatomy and Physiology will consist of 90 marks. Internal Assessment shall be of 10 Marks.

Paper-II: Physiological and Visual Optics

Theory:

The subject of the Physiological and Visual Optics examination shall consist of one Theory Paper of three hours duration and a maximum of 90 marks.

The internal assessment shall be of 10 Marks.

The syllabus to be covered is mentioned in Appendix "B".

The written paper will consist of two sections, as detailed below.

Section I: Physiological Optics = 50 marks

There will be 05 short essay questions for the subject of Physiological Optics, and there will be no choice. Each short essay question will carry 05 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: Visual Optics = 50 marks

There will be 05 short essay questions about Visual Optics, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 05 marks. Oral/ Practical Examination in the subject of Physiological Optics and Visual Optics will consist of OSPE -Short case/ Long case with a maximum of 90 marks. The internal assessment shall be of 10 Marks.

Paper-III: Physical, Geometrical and Instrument Optics

The examination in the subject of Physical, Geometrical and Instrument Optics shall consist of one Theory Paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of three sections, as detailed below.

Section I: Physical Optics = 30 marks

There will be 03 short essay questions on the subject of Physical Optics, and there will be no choice. Each short essay question will carry 5 marks. There will be 12 MCQs, and each question will carry 1 mark. Internal assessment will be of 3 marks.

Section II: Geometrical Optics = 40 marks

There will be 05 short essay questions about Geometrical Optics, and there will be no choice. Each short essay question will carry 5 marks. There will be 11 MCQs, and each question will carry 1 mark. Internal assessment will be of 4 marks.

Section III: Instrument Optics = 30 marks

There will be 3 short essay questions about Instrument Optics, and there will be no choice. Each short essay question will carry 5 marks. There will be 12 MCQs, and each question will carry 1 mark. Internal assessment will be of 3 marks. Oral/ Practical Examination in the subject of Physical, Geometrical and Instrument Optics will consist of OSPE -Short case/ Long case with maximum of 90 marks. Internal Assessment shall be of 10 Marks.

Paper-IV: Orthoptics, Squint and Low Vision

The examination in the subject of Orthoptics, Squint and Low Vision shall consist of one Theory Paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of two sections, as detailed below.

Section I: Orthoptics & Squint = 50 marks

There will be 05 short essay questions about Orthoptics & Squint, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: Low Vision = 50 marks

There will be 05 short essay questions about Low Vision, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks. Oral/ Practical Examination in the subject of Orthoptics, Squint and Low Vision will consist of OSPE -Short case/ Long case with maximum of 90 marks. The internal assessment shall be of 10 Marks.

THIRD PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

PAPER	SUBJECTS	THEORY MARKS	PRACTICAL MARKS*	TOTAL MARKS
Paper-I	Ophthalmic Dispensing and Contact Lenses	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-II	Ophthalmic Diseases and Pharmacology	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-III	Clinical Optometry and Examination	90 + 10 marks for internal assessment	180 + 20 marks for internal assessment	300
Paper-IV	Clinical Optometry and Examination	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Pass Marks= 50%			Total Marks = 900	
*OSPE-Short case/ Long case				

OUTLINE THE THIRD PROFESSIONAL EXAMINATION

The third Professional Examination shall be held at the end of the third year and shall consist of the following subjects: The syllabus details are outlined in Appendix B.

Paper-I: Ophthalmic Dispensing and Contact Lenses

Written paper:

The examination on the subject of Ophthalmic Dispensing and Contact Lenses shall consist of one Theory paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of two sections, as detailed below.

Section I: Contact Lenses

There will be 05 short essay questions about Contact Lenses Therapy, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 05 marks.

Section II: Ophthalmic Dispensing = 50 marks

There will be 05 short essay questions about Ophthalmic Dispensing Therapy, and there will be no choice. Each short essay question will carry 05 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 05 marks. Oral/ Practical Examination in the subject of Ophthalmic Dispensing will consist of OSPE -Short case/ Long case with a maximum of 90 marks. The internal assessment shall be of 10 Marks.

Paper-II: Ophthalmic Diseases and Pharmacology

Written paper:

The Ophthalmic Diseases and Pharmacology examination shall consist of one Theory paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of two sections, as detailed below.

Section I: Ophthalmic Diseases (Local & Systemic) = 50 marks

There will be 05 short essay questions on the subject of Ophthalmic Diseases, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: Ophthalmic Pharmacology = 50 marks

There will be 5 short essay questions on the subject of Ophthalmic Pharmacology, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks. Oral/ Practical Examination in the subject of Ophthalmic Diseases and Pharmacology will consist of OSPE - Short case/ Long case with a maximum of 90 marks. Internal Assessment shall be of 10 Marks.

Paper-III: Clinical Optometry and Examination

The examination of Clinical Optometry and Examination shall consist of one Theory paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". There will be 9 short essay questions on the subject of Clinical Optometry and Examination, and there will be no choice. Each short essay question will carry 5 marks. There will be 45 MCQs, and each question will carry 1 mark. Oral/ Practical Examination in the subject of Clinical Optometry and Examination will consist of OSPE -Short case/ Long case with a maximum of 180 marks. Internal Assessment shall be of 20 Marks.

Paper-IV: Occupational Optometry and Preventive Ophthalmology

The examination in the subject of Occupational Optometry and Preventive Ophthalmology shall consist of one Theory paper of three hours duration and a maximum of 90 marks. The internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". The written paper will consist of two sections, as detailed below.

Section I: Occupational Optometry = 50 marks

There will be 05 short essay questions on the subject of Occupational Optometry Therapy, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks.

Section II: Preventive Ophthalmology

There will be 05 short essay questions on the subject of Preventive Ophthalmology Therapy, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Internal assessment will be of 5 marks. Oral/ Practical Examination in the subject Occupational Optometry and Preventive Ophthalmology will consist of OSPE -Short case/ Long case with a maximum of 90 marks. Internal Assessment shall be of 10 Marks.

FINAL PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

PAPER	SUBJECTS	THEORY MARKS	PRACTICAL MARKS*	TOTAL MARKS
Paper-I	Pediatric Optometry	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-II	Ophthalmic Instrumentation	90 + 10 marks for internal assessment	90 + 10 marks for internal assessment	200
Paper-III	Biostatistics and Research Methods	45 + 5 marks for internal assessment	45 for research report + 5 marks for internal assessment	100
Pass Marks= 50%			Total Marks = 500	
*OSPE-Short case/ Long case				

OUTLINE FINAL PROFESSIONAL EXAMINATION

The Final Professional Examination shall be held at the end of the fourth. It shall consist of the following subjects: The syllabus details are outlined in Appendix B.

Paper-I: Pediatric Optometry

The subject of Pediatric Optometry examination shall consist of one Theory Paper of three hours duration and a maximum of 45 marks. Internal assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". There will be 09 short essay questions on the subject of Pediatric Optometry, and there will be no choice. Each short essay question will carry 5 marks. There will be 45 MCQs, and each question will carry 1 mark. Oral/ Practical Examination in the subject of Pediatric Optometry will consist of OSPE -Short case/ Long case with a maximum of 45 marks. Internal Assessment shall be of 10 Marks.

Paper II: Ophthalmic Instrumentation

The examination on the subject of Ophthalmic Instrumentation shall consist of one Theory Paper of three hours duration and a maximum of 90 marks. Internal Assessment shall be of 10 Marks. The syllabus to be covered is mentioned in Appendix "B". There will be 09 short

essay questions on the subject of Ophthalmic Instrumentation, and there will be no choice. Each short essay question will carry 05 marks. There will be 45 MCQs, and each question will carry 1 mark. Oral/ Practical Examination in the subject of Ophthalmic Instrumentation will consist of OSPE -Short case/ Long case with a maximum of 90 marks. Internal Assessment shall be of 10 Marks.

Paper III: Biostatistics and Research Methods

The examination on Biostatistics and Research Methods subject shall consist of one Theory Paper of one & a half hours duration and a maximum of 45 marks. Internal Assessment shall be of 5 Marks. The syllabus to be covered is mentioned in Appendix "B". There will be 5 short essay questions about Biostatistics and Research Methods, and there will be no choice. Each short essay question will carry 5 marks. There will be 20 MCQs, and each question will carry 1 mark. Oral Examination of the research report will be a maximum of 45 marks. The internal assessment shall be of 5 Marks.

APPENDIX–B: COURSE CONTENTS

FIRST PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

Paper-I: BASIC ANATOMY & PHYSIOLOGY

Theory Marks:	90
Internal assessment	05
Total Marks:	100
Pass Marks:	50%
Total study hours:	200

Syllabi and Course of Reading

Note: Syllabi and the course of reading are divided into two parts. 100 hours will be allocated to Section I, and 100 hours will be allocated to Section II. The question paper will carry 50 theory marks for each part.

Section I: BASIC ANATOMY

Introduction regarding

- Anatomical Nomenclature
- Life span of a human being
- Structural and functional organization
- Terminology and body plan
- Systematic Anatomy
- Basic organization of the body

Skin

- The structure of the hypodermis, dermis. and epidermis.
- Superficial fascia and deep fascia

The Musculoskeletal System: Muscles, Bones and Joints

- Components of the Skeletal System
- Description of Axial & Appendicular Skeleton
- The process of bone ossification. Growth, Remodelling, and repair
- Main features of the skull, including all views
- Shape and regions of the vertebral column
- Important features of the regional vertebrae
- Bones of the thoracic cage, including the types of ribs.
- The bones of the pectoral girdle and upper limb
- The bones of the pelvic girdle and lower limb
- Various types of joints and types of joint movement
- connective tissue, components of the connective tissue matrix
- Description of skeletal muscle, smooth muscle and cardiac muscle
- Origin, insertion. synergist, antagonist and prime mover.
- The movements of the arm, forearm and hand and the involved muscle groups
- Muscles of the trunk and the actions they accomplish.
- Movements of the thigh, leg and foot with involved muscle groups

The Nervous System

- Division of the Nervous System and the characteristics of each.
- Central Nervous System
- Peripheral Nervous System
- Autonomic Nervous System
- Special Senses
- Anatomical pathways and description of:
- Olfactory system---- olfactory neurons
- Hearing, balance and structure of the outer middle and inner ear

- Taste ---- taste bud.
- Visual --- chambers of the eye and structure of the rods and cones
- The structure of a neuron, nerve, nerve tract, nucleus, and ganglion.
- The components of a reflex arc and synapse
- The three meningeal layers surrounding the central nervous system,
- Cerebrospinal fluid and its circulation.
- List the various cranial nerves
- Various lobes of the brain and the cerebellum

The Cardiovascular System

- Anatomy of the Heart---- the size, shape and location of the heart and
- Chambers, valves and their locations
- The location of the coronary arteries
- The structure of the conduction system of the heart.
- Pulmonary and systemic circulation
- The structure of arteries, capillaries and veins.
- Major arteries and veins and the body areas, where they supply blood
- Lymphatic system tonsils, lymph nodes, the spleen and the thymus.

Respiratory System

- The anatomy of the respiratory passages, beginning at the nose and ending with the alveoli.
- The lobes of the lungs and the membranes that cover the lungs
- Pleural cavity
- The muscles of contraction of respiration

The Digestive System

- The structure of the organs that make up the digestive tract and their relations to other

organs in the thoracic and abdominal cavity.

- Blood supply of the organs of the GI tract
- Important secretory glands, the liver and pancreas (both exocrine and endocrine components).

Genito-Urinary System

- The structures and organs of the urinary system and its relations with other organs
- The structure of the nephron
- Formation of Sex Cells
- Organs of the Male Reproductive System
- Organs of the Female Reproductive System

Recommended Books:

- Essentials of anatomy and physiology by Seely, Stephens, and Tate (4th ed)
- Anatomy & Physiology by Ross & Wilson
- General Anatomy by Laeeq Hussain
- General Anatomy by Dr Ghulam Ahmad
- Anatomy by D. R. Johnson & K. L. Moore
- Color Atlas of anatomy by Mc Minn
- Lasts Anatomy by R.M.H McMinn

Section II: BASIC PHYSIOLOGY

Introduction To the Human Physiology

- Functional organization---relationship between structure and function of the human body
- Homeostasis – its importance-- negative and positive feedback mechanism

Integumentary System

- Functions of the skin, hair, glands and nails
- Body temperature and its regulation

The Musculoskeletal System:

- Functions of the bones and muscles
- Functional characteristics of Skeletal Muscle, Smooth Muscle and Cardiac Muscle
- The muscle contraction and relaxation events in response to an action potential in a motor neuron.
- Distinguish between aerobic and anaerobic muscle contraction.
- Muscle hypertrophy and atrophy

The Nervous System

Functions of the central nervous system,

- The functional areas of the cerebral cortex and their interactions.
- Functions of the parts of the brainstem diencephalons, basal nuclei. Limbic system. And cerebellum.
- Functions of various cranial nerves.
- Functions of the somatic motor nervous system
- Functions of the autonomic nervous system
- The function of neurons, neuroglial cells and their components.
- Resting membrane potential and action potential.
- The function of a synapse and reflex arc

The functions of the specialized sense organs

- Eye---- physiology of site, accommodation, optic nerve and optic chiasma
- Ear---- functions of the internal, middle and external ear
- Physiology of the hearing and balance
- Smell----- physiology of olfactory nerve
- Taste -----physiology of taste
- Location of the taste buds
- Physiology of speech

The Endocrine System

- Functions of the Endocrine System
- Chemical Signals, receptors and hormones
- The Endocrine Glands and their Hormones
- Other Hormones

Blood

- Composition of Blood and Plasma
- Functions of Blood
- Formed Elements
- Stages of cell development
- Blood grouping
- Coagulation mechanism

The Cardiovascular system

- Functions of the Heart
- Electrical Activity of the Heart origin and propagation of cardiac impulse
- Phases of the Cardiac Cycle
- Heart Sounds
- Regulation of Heart Functions--- intrinsic and extrinsic
- Functions of the Peripheral Circulation
- The Physiology of Circulation
- Pulmonary Circulation
- Systemic Circulation: Arteries
- Veins
- Local Control of Blood Vessels
- Nervous Control of Blood Vessels

- Regulation of Arterial Pressure
- The function of the Lymphatic System, tonsils, lymph nodes, spleen and thymus.

Respiratory System

- Functions of the Respiratory System beginning at the nose and ending with the alveoli.
- Ventilation and Lung Volumes
- Gas Exchange and gas transport in the blood
- Rhythmic Ventilation

The Digestive System

- Functions of each organ of the Digestive System, including major salivary glands
- Movements and Secretions in each organ of the Digestive System and their regulation
- Physiology of Digestion, Absorption, and Transport
- Genito-Urinary System
- Urine Production, Urine Movement
- Regulation of Urine Concentration and Volume
- Body Fluid Compartments
- Regulation of Extracellular Fluid Composition
- Regulation of Acid-Base Balance
- Physiology of Male Reproductive system—spermatogenesis and reproductive glands, hormones and their regulations
- Physiology of Female Reproductive system--- ovulation, hormones and their regulations
- Immunity
- Define immunity, Innate Immunity, Adaptive Immunity
- Antigens and Antibodies
- Primary and secondary responses to an antigen

- Antibody-mediated immunity and cell-mediated immunity
- Role of lymphocytes in immunity regulation

Recommended Books

- Essentials of Anatomy and Physiology by Seelay, Stephens and Tate. 4th edition
- Ross & Wilson Anatomy and Physiology.
- Human Physiology. Stuart Ira Fox. 7th edition
- Text Book of Medical Physiology Guyton
- Essential of Medical Physiology Vol.I & II by Mushtaq Ahmad.
- Lecture notes on human physiology by Bray JJ, Cragg, PA MacKnight

PAPER II: BASIC BIOCHEMISTRY AND GENERAL PATHOLOGY

Theory Marks:	90
Internal assessment	05 Marks in each subject
Total Marks:	100
Pass Marks:	50%
Total study hours:	200

Syllabi and Course of Reading

Note: Syllabi and the course of reading are divided into two parts. 100 hours will be allocated to Section I, and 100 hours will be allocated to Section II. The question paper will carry 50 theory marks for Basic biochemistry and 50 theory marks for General Pathology.

Section I: BIOCHEMISTRY

Physiochemical Principles

- Hydrogen ion conc. and pH notation
- Acidity & Alkalinity
- Indicators & Buffer solutions
- PH and its determination
- The colloidal state
- Absorption
- Structure and function of cell membrane and movement of materials across cell membrane
- Osmosis & Osmotic pressure
- Surface tension
- Viscosity

Carbohydrates

- Introduction and classification of carbohydrates
- Some important monosaccharides, disaccharides and polysaccharides

- Regulation of blood glucose level
- Definition and end products of
- glycolysis
- citric acid cycle
- Glycogenolysis
- Glycogenoses
- Gluconeogenesis

Proteins And Amino Acids

- Introduction, importance, classification and properties of proteins
- Entry of amino acids into cells and peptide linkage
- Special sources of proteins

Lipids

- Introduction, Classification and Function of lipids
- Biosynthesis of fatty acids, natural fats or triglycerides
- Fatty acid oxidation
- Vitamins And Minerals
- Classification of vitamins
- Fat soluble vitamins and water-soluble vitamins
- Deficiency effects

Enzymes

- Introduction, Classification Chemical nature and properties of enzymes
- The mechanism of enzyme reactions
- Factors affecting the enzyme activity
- Important coenzymes and their actions
- Regulatory enzymes

Nutrition and Dietetics

- Balanced diet
- Role of carbohydrates, fats and proteins, their dietary sources and uses in the body
- Quantitative and qualitative daily requirements of carbohydrates, fats, proteins, vitamins and minerals

Recommended Books

- Review of Biochemistry by Lippincott
- Essential of Medical Biochemistry Vol.I & II by Mushtaq Ahmad.
- Fundamentals of Biochemistry by D. Voet, J.G.Voet (1999)
- Text Book of Biochemistry with Clinical Correlations by T.M.Devlin.
- Modern Experimental Biochemistry by R.F.Boyer.

Section II: GENERAL PATHOLOGY

Cell Injury and adaptation

Cell Injury

- Reversible and Irreversible Injury
- Fatty change, Pigmentation, Pathologic calcification
- Necrosis and Gangrene

Cellular adaptation

- Atrophy, Hypertrophy,
- Hyperplasia, Metaplasia, Aplasia

Inflammation

- Acute inflammation --- vascular changes, Chemotaxis, Opsonization and Phagocytosis
- Enlist the cellular components and chemical mediators of acute inflammation
- Differentiate between exudates and transudate
- Chronic inflammation

- Etiological factors, Granuloma

Cell repair and wound healing

- Regeneration and Repair
- Healing--- steps of wound healing by first and second intention
- Factors affecting healing
- Enlist the complications of wound healing

Haemodynamic disorders

- Define and classify the terms Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia with at least two examples of each.
- Define and classify Shock with causes of each.
- Describe the compensatory mechanisms involved in shock
- Describe the possible consequences of thrombosis
- Describe the difference between arterial and venous emboli

Neoplasia

- Define the terms Dysplasia and Neoplasia with examples
- Enlist the differences between benign and malignant neoplasms
- Enlist the common etiological factors for neoplasia
- Define and discuss the different modes of metastasis

Recommended Books

- Pocket companion to Robbins. Pathologic basis of disease Cotran, Kumar, Collins

PAPER III: ISLAMIC STUDIES/ETHICS & PAKISTAN STUDIES

Theory Marks:	54
Internal assessment	6 marks
Total Marks:	60
Pass Marks:	33%
Total study hours:	100

Syllabi and Course of Reading

Note: Syllabi and the course of reading are divided into two parts 50 hours will be allocated for Section I, and 50 hours will be allocated to Section II. The question paper will carry 60 theory marks for Islamiyat and 40 theory marks for Pakistan studies. Non-muslims can appear in the subject of Ethics instead of Islamiyat. Candidates can attempt the paper in Urdu or English.

Section I: ISLAMIYAT/Ethics

Ethics (for non-muslims)

- Ethical Teachings of world religion with special reference to Buddhism, Judaism, Christianity and Islam.
- 100 ethical precepts from the Quran and the Sayings of the Prophet.

The Arabic text of the Holy Quran and Ahadith would not be advisable for inclusion in the syllabus for Non-Muslims. Instead, the teachings of the Holy Quran and sunnah relating to the following topic should be explained in English or Urdu. Hence, questions about this portion of the syllabus should be based on the subject matter rather than the texts.

Virtues

Duty towards parents: respect for human life, unity of mankind, peace, justice, tolerance, beneficence, pity, contentment, chastity, meekness, repentance, social solidarity, individual accountability, moral excellence, patience and perseverance, forgiveness,

Vices

Arrogance, ostentation, extravagance, misery, greed, jealousy, suspicion, backbiting, coercion, hypocrisy, bribery, obscenity and immodesty.

- Promotion of moral values in society.
- Attitude of Islam Towards Minorities

Theory Marks: 54

Internal assessment: 6 Marks

Total Marks: 60

Pass Marks: 33%

Islamic Studies / Ethics and Pakistan Studeis

مقاصد: نصاب کی تدریس کا مقصد طلباء کو اس قابل بنانا ہے کہ وہ :-

- ۱- اسلام کے معنی و مفہوم کو سمجھ سکیں۔
- ۲- اسلام کی بنیادی تعلیمات کو اچھی طرح سمجھ کر ان پر عمل کر سکیں۔
- ۳- یہ حقیقت ذہن نشین کر سکیں کہ اسلام ہی آج کی انسانی زندگی کے تمام مسائل کو بطریق احسن حل کرنے کی صلاحیت رکھتا ہے۔

نصاب:

کتاب و سنت

(ا) قرآن مجید

- ۱- فضائل قرآن ۲- سورہ الحجرات، متن اور ترجمہ کے ساتھ ۳- سورہ الفرقان، عباد الرحمن۔ الی
- آخر السعدہ، آیت ۷۷ تا ۸۳۔

(ب) سنت

سنت کی اہمیت۔

بیس منتخب احادیث، متن و ترجمہ کے ساتھ۔

- ۱- وَعَنْ عَبْدِ اللَّهِ بْنِ عَمْرٍو قَالَ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ لَا يُؤْمِنُ أَحَدُكُمْ حَتَّى يُكُونَ هَوَاهُ نَبَاهًا لِمَا جِئْتُ بِهِ.
- ۲- عَنْ عُمَرَ بْنِ عَبْدِ الرَّحْمَنِ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ إِنَّ أَفْضَلَكُمْ مَنْ تَعَلَّمَ الْقُرْآنَ وَعَلَّمَهُ.
- ۳- يَنْبَغِي لِلْمُؤْمِنِ أَنْ لَا يَمُوتَ حَتَّى يُتَعَلَّمَ الْقُرْآنَ أَوْ يُكُونَ فِي تَعْلِيمِهِ.
- ۴- عَنْ عُمَرَ بْنِ الْخَطَّابِ رَضِيَ اللَّهُ عَنْهُ قَالَ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ إِنَّ اللَّهَ يَرْفَعُ بِهَذَا الْكِتَابِ أَقْوَامًا وَيُنْزِعُ بِهِ الْآخَرِينَ.
- ۵- عَنْ مُسْلِمَةَ بِنْتِ قَبِيْسٍ رَضِيَ اللَّهُ عَنْهُ قَالَ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ اسْتَسْنَفَ بِالْقُرْآنِ فَإِنَّ اللَّهَ يُغْفِرُ لِمَا فِي الصُّدُورِ وَفِي رِوَايَةٍ عَنْهُ مَنْ لَمْ يَسْتَسْنَفِ الْقُرْآنَ فَلَا تُغْفَاهُ اللَّهُ.
- ۶- عَنْ مُعَاذِ بْنِ جَبَلٍ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ ثَلَاثٌ مَنْ كُنَّ فِيهِ فَهُوَ مَنَّانٌ وَإِنْ صَلَّى وَصَامَ وَرَزَعَهُ أَنَّهُ مُؤْمِنٌ إِذَا حَدَّثَ كَذَبًا وَإِذَا وَعَدَ أَخْلَفَ وَإِذَا أُؤْتِيَ حَانَ.
- ۷- عَنْ نُبَيْ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ لَا يُؤْمِنُ أَحَدُكُمْ حَتَّى يُجِبَّ لِإِخِيهِ مَا يُجِبُّ لِنَفْسِهِ.
- ۸- عَنْ عَائِشَةَ رَضِيَ اللَّهُ عَنْهَا عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ خَيْرُ النَّاسِ أَتْفَعُهُمْ لِلنَّاسِ وَفِي رِوَايَةٍ خَيْرُ النَّاسِ مَنْ تَفَعَّ بِه النَّاسُ.
- ۹- عَنْ أَنَسِ بْنِ مَالِكٍ رَضِيَ اللَّهُ عَنْهُ قَالَ قَدَّمَا حَطَلْنَا رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ إِذَا قَالَ لَا إِيمَانَ لِمَنْ لَا أَمَانَةَ لَهُ وَلَا دِينَ لِمَنْ لَا عَهْدَ لَهُ.
- ۱۰- عَنْ الْحَسَنِ رَضِيَ اللَّهُ عَنْهُ مَرْسَلًا حُبُّ الدُّنْيَا رَأْسُ كُلِّ خَبِيْثَةٍ.
- ۱۱- عَنْ أَبِي سَعِيدٍ الْخُدْرِيِّ رَضِيَ اللَّهُ عَنْهُ قَالَ سَمِعْتُ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ يَقُولُ مَنْ رَأَى مِنْكُمْ مُتَكَبِّرًا فَلْيَعْبِرْهُ بِدَبِّهِ فَإِنَّ

- لَمْ يَسْتَطِيعَ فَيْسَابِهِ وَإِنْ لَمْ يَسْتَطِيعَ فَيَقْلِبِهِ وَ ذَلِكَ أَسْعَفُ الْإِيمَانِ۔
- ۱۲۔ عَنْ عَائِشَةَ رَضِيَ اللَّهُ عَنْهَا عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ إِذَا أَكَلْتُمْ مِنْ ثَمَرِ شَجَرٍ أَسْمِ اللَّهُ فِي أَوَّلِهِ فَلْيَقُلْ بِاسْمِ اللَّهِ أَوَّلَهُ وَ آخِرَهُ۔
- ۱۳۔ عَنْ ابْنِ عَبَّاسٍ رَضِيَ اللَّهُ عَنْهُ قَالَ نَهَى رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ أَنْ يَتَنَقَّسَ فِي الْإِنَاءِ أَوْ يَتَفَخَّ فِيهِ۔
- ۱۴۔ عَنْ مُحَمَّدِ بْنِ مُعَدْيِ كَرِبٍ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ مَا سَأَلَهُ أَحَدٌ مِنْ بَنِي إِسْرَائِيلَ مِنْ بَطْنِيهِ بِحَسَبِ ابْنِ آدَمَ أَكَلَاتٍ يُقِيمُنَّ صَلَاتَهُ فَإِنْ كَانَ لَا مَخَالََةَ فَلْيُطْعَمِهِ وَ لَوْ لَبَّاسًا بِرَأْسِهِ وَ لَوْ لَبَّاسًا بِرَأْسِهِ وَ لَوْ لَبَّاسًا بِرَأْسِهِ۔
- ۱۵۔ عَنْ عَائِشَةَ رَضِيَ اللَّهُ عَنْهَا قَالَتْ مَا سَمِعْتُ آلَ مُحَمَّدٍ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ مِنْذُ قَدِيمِ الْمَدِينَةِ مِنْ طَعَامٍ يَرْتَدُّ لِيَابِ بِنَاغٍ حَتَّى فَيُضَى۔
- ۱۶۔ عَنْ عَبْدِ اللَّهِ بْنِ مُحْصِبٍ عَنْ أَبِيهِ أَنَّ النَّبِيَّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ مَنْ أَسْبَحَ بِكُمْ أَبْنًا فِي سُرْبِهِ مَعَاذِي فِي حَسْبِهِ عِنْدَهُ فَوَرَّتْ يَوْمَهُ فَكَأَنَّمَا جِزَّتْ لَهُ الْأُنْبُا۔
- ۱۷۔ عَنْ الْحَارِثِ بْنِ عَاصِمِ الْأَشْمَعِيِّ رَضِيَ اللَّهُ عَنْهُ قَالَ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ الطُّهُورُ سَطْرُ الْإِيمَانِ وَ فِي رِوَايَةٍ لِابْنِ أَبِي شَيْبَةَ أَنَّ النَّبِيَّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ لَوْ لَا أَنُشِقَ عَلَيَّ أُخْيٌ لَأَمَرْتُهُمْ بِالسُّبُوكِ عِنْدَ كُلِّ صَلَاةٍ۔
- ۱۸۔ عَنْ أَبِي هُرَيْرَةَ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ لَوْ لَا أَنُشِقَ عَلَيَّ أُخْيٌ لَأَمَرْتُهُمْ بِالسُّبُوكِ عِنْدَ كُلِّ صَلَاةٍ۔
- ۱۹۔ عَنْ أَبِي النَّوْدَاءِ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ أَنَّ اللَّهَ أَنْزَلَ النَّوَاءَ وَالنَّوَاءَ وَ جَعَلَ لِكُلِّ دَاءٍ دَوَاءً فَتَدَاوُوا وَ لَا تَتَدَاوُوا بِحَرَامٍ۔
- ۲۰۔ عَنْ أَبِي هُرَيْرَةَ رَضِيَ اللَّهُ عَنْهُ عَنِ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ (فِي حَدِيثٍ طَوِيلٍ) قَالَ إِنَّ اللَّهَ عَزَّ وَجَلَّ يُقُولُ يَوْمَ الْقِيَامَةِ يَا ابْنَ آدَمَ مَرَحْتَ فَلَمْ تُعَادِنِي قَالَ يَا رَبِّ كَيْفَ أَعُوذُكَ وَأَنْتَ رُبُّ الْعَالَمِينَ؟ قَالَ أَمَا عَلِمْتَ أَنَّ عَبْدِي فَلَانًا مَرَحَ فَلَمْ تُعَادِنِي أَمَا عَلِمْتَ لَوْ عُدَّتْهُ لَوْ جَدَّتْنِي عِنْدَهُ!۔

۳۔ دین اسلام۔ آیات قرآنی اور احادیث کی روشنی میں:

- ۱۔ توحید ۲۔ رسالت ۳۔ آخرت ۴۔ نماز ۵۔ روزہ ۶۔ زکوٰۃ ۷۔ حج ۸۔ جہاد
- ۳۔ اسوہ حسنہ، حضور صلی اللہ علیہ وسلم کی سیرت کا مطالعہ
- ۱۔ رہبر مہذبیت ۲۔ معلم و محرف ۳۔ مبلغ و داعی ۴۔ سپہ سالار ۵۔ مدیر شام ۶۔ سربراہ خاندان ۷۔ تاجر ۸۔ عابد و زاہد

تعمیر کردار: تعارف و تمہید (اسلام میں تعمیر کردار کی اہمیت)

(الف) اخلاقِ حسنہ، تقویٰ اور اخلاص، صدیق، سخاوت، عفت، دیانتداری، رحم، عدل

(سماجی، معاشی انصاف) احسان ابقائے عہد، ایثار، سادگی، رواداری، احترام آدمیت، اخوت، والدین اور بزرگوں کا احترام، کسبِ حلال۔

(ب) رذائلِ اخلاق، تعارفِ تمہید

تکبر، بہتان طواری، غیبت، منافقت، خوشامد، حرص، ناب قول میں کمی بیشی، رشوت اسراف، سود، حسد، نمائش پسندی، ذخیرہ اندوزی، ظلم، فتنہ و فساد۔

تہذیب انسانی کی تعمیر میں اسلام کا کردار (Resurgence)۔

امت مسلمہ، احیائے اسلام کی تحریکیں اور ہمارا مستقبل۔

Section II: PAKISTAN STUDIES

Total Marks: 40

Study Hours: 50

Pass Marks: 33%

یونٹ نمبر (۴): تحریک پاکستان

- ۱۔ مسلم قومیت اور دوقومی نظریہ کا ارتقاء
- ۲۔ ہندوستان کی آزادی کا مسئلہ اور مسلمان۔
- ۳۔ علامہ اقبال کا خطبہ الہ آباد۔
- ۴۔ انتخاب ۱۹۳۷ء اور کانگریس حکومتوں کا رویہ۔
- ۵۔ قرارداد پاکستان
- ۶۔ ہندو کانگریز کا رد عمل۔
- ۷۔ ۱۹۴۶ء کے انتخابات اور انتقال اقتدار

یونٹ نمبر (۵): پاکستان کے حصول کے لئے جدوجہد

- پاکستان کے لئے مسلم عوام کی جدوجہد
- ۱۔ اقلیتی صوبوں کے مسلمانوں کا کردار اور ایثار۔
 - ۲۔ سرحد، بلوچستان، سندھ، کشمیر اور پنجاب کے مسلمانوں کا حصہ۔

یونٹ نمبر (۶): تحریک پاکستان میں:

- ۱۔ علماء اور مشائخ۔
- ۲۔ ادیب اور صحافی۔
- ۳۔ طلباء اور جوانوں کا حصہ۔

یونٹ نمبر (۷): قیام پاکستان کے اہم واقعات
یونٹ نمبر (۸): پاکستان میں نظام اسلام کے نفاذ کی کوشش

- ۱۔ قرارداد مقاصد۔
- ۲۔ ۱۹۴۶ء اور ۱۹۷۳ء کے آئین کی اسلامی دفعات اور کشمیر۔
- ۳۔ نماز شریعت، ابتدائی اقدامات۔
- ۴۔ ہماری منزل۔ مکمل اسلامی معاشرہ کا قیام

Theory Marks:	90
Internal Assessment	5 Marks in each subject
Total Marks:	100
Pass Marks:	50%
Total study hours:	200

Syllabi and course of reading

Note: Syllabi and the course of reading are divided into two parts. 100 hours will be allocated to Section I, and 100 hours will be allocated to Section II. The question paper will carry 50 theory marks for Behavioural Sciences and 50 theory marks for Computer Education.

Section I: BEHAVIOURAL SCIENCES

Total Marks: 50

Pass Marks: 50%

Study hours: 100

1. Introduction to Behavioural Sciences and its importance in health.

- Bio-Psycho-Social Model of Health Care and the Systems Approach
- Normality vs Abnormality
- Importance of Behavioural sciences in health
- Desirable Attitudes among Health Professionals

2. Understanding Behaviour

Sensation and sense organs

Describe sensation, sense organs/special organs

Perception

Define perception; what factors affect perception

Attention and concentration

Define attention and concentration. What factors affect them

Memory

Define memory and describe its stages, types and methods for improving it

Thinking

- Define thinking; describe its types and theories
- What is cognition and levels of cognition?
- Discuss problem-solving and decision-making strategies

Communication

Define communication. What are the types, modes and factors affecting it? Describe ways to recognize non-verbal cues. Characteristics of a good communicator

3. Individual Differences

Personality

Define personality. What factors affect personality development? How can personality be assessed? Influence of personality in determining reactions during health, disease, hospitalization, stress

Intelligence.

- Define intelligence and the various types of intelligence.
- What factors affect it, and how can it be assessed?

Emotions

- Define emotions. What are the various types of emotions?
- Emotional Quotient (EQ)- concept & utility

Motivation

Define motivation and what are the types of motivation?

4. Learning

Define learning, Principles of learning, modern methods and styles of learning, types of learners, Strategies to improve learning skills

5. Stress and Stressors

- Define and classify stress and stressors
- Relationship of stress and stressors with illness

6. Life Events

Concept of life events and their relationship with stress and illness

7. Stress Management

- What are coping skills
- What are conflict and frustration?
- What is the concept of adjustment and maladjustment?

8. Interviewing / Psychosocial History Taking

- Define, types of interviews and listening
- Skills of interviewing and listening

9. Allied Health Ethics-Hippocratic oath

- Do's and Don'ts
- What is the concept of Allied Health ethics?

10. Culture and Allied Health practice

- Concept of group, its dynamics
- Attitude, value, belief, myths, social class, stigma, sick role and illness, health belief models

11. Psychological reactions

- Grief and bereavement, Family and illness
- Dealing with difficult patients
- What are the psychosocial aspects of illness, hospitalization, rape, torture, terminal illness, death and dying?
- Psychosocial issues in Emergency Departments, Intensive Care and Coronary Care Units, Operating Theatres, Cancer wards, Transplant Units, Anaesthesia

12. Breaking Bad News

Introduction, Models, Methods, Death of the patient, abnormal baby, intractable illness

13. Pain, Sleep, Consciousness

- Concept of pain.
- Physiology of pain,
- Altered states of consciousness.

14. Communication skills

- Counselling,
- Crisis Intervention
- Conflict Resolution
- Principles of effective communication, active listening, the art of questioning
- The art of listening.
- Good and bad listener.
- Counselling: Scope, Indications and Contraindications,
- Steps, Do's and Don'ts, How to deal with real life crisis and conflict situations in health settings

Section II: COMPUTER EDUCATION

Introduction To Computers

- Definition
- Usage and functionality of computers
- Limitations of Computers
- Classification of Computers
- Basic Components of Computers
- Hardware

Software

- System Software

- Application Software
- Equipment's/devices in Personal computer system
- Input devices
- Output devices
- Storage devices
- The processor

Microsoft Windows

- Introduction to MS-Windows
- Arranging, Moving and Resizing Windows.
- Identifying the components of desktop.
- Moving, Changing and Closing Windows.
- Crating, Opening and Deleting items and folders.
- Working with My Computer
- Deleting and Resume Print Jobs.
- Using Control Panel
- Working with Accessories.

Microsoft Office

- Microsoft Win Word
- Microsoft Excel
- Microsoft Power Point
- Database
- Internet and Email
- Using Internet Explorer

- **SECOND PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION**

Paper-I: OPHTHALMIC ANATOMY AND PHYSIOLOGY

Theory Marks	90
Internal Assessment	10 Marks
Practical Marks	90
Internal Assessment	10 Marks
Total Marks:	200
Pass Marks:	50%
Theory hours:	200
Practical Hours:	200
Total study hours:	400

Section I: OPHTHALMIC ANATOMY

- Anatomy (General Introduction)
- Anatomy of the Eye Lid
- Anatomy of the Cornea
- Anatomy of the Sclera and its Openings
- Anatomy of the Limbus and Conjunctiva
- Anatomy of the Anterior Chamber
- Anatomy of the Lacrimal Apparatus
- Anatomy of the Extra – Ocular Muscles
- Anatomy of the Skull & Orbit
- Anatomy of the Uveal Tract
- Anatomy of the Lens & Vitreous
- Anatomy of the Retina
- Anatomy of the Choroid

- Anatomy of the Brain
- Anatomy of the Optic Nerve & Tract
- Anatomy of the Visual Cortex
- Anatomy of the Visual Pathway
- Anatomy of Cranial Nerves (I – VII)

Section II: OPHTHALMIC PHYSIOLOGY

- Normal Vision Development
- Physiology of the Eye Lid
- Physiology of the Cornea
- Physiology of the Tear Film
- Physiology of Lacrimal System
- Physiology of Pupil & Reflexes
- Motor Law's
- Physiology of Aqueous Humour
- Physiology of Lens Metabolism
- Physiology of Accommodation & Convergence
- Physiology of the Retina
- Dark and light adaptation
- Physiology of the color vision
- Visual Pigments
- Physiology of the Extra Ocular Muscles
- Visual Pathway
- Homeostatic Mechanism of the Eye
- Immunity & Allergy
- Tissue & Organ Transplant

PAPER-II: PHYSIOLOGICAL AND VISUAL OPTICS

Theory Marks	90
Internal Assessment	10 Marks
Practical Marks	90
Internal Assessment	10 Marks
Total Marks:	200
Pass Marks:	50%
Theory hours:	200
Practical Hours:	200
Total study hours:	400

Section I: PHYSIOLOGICAL OPTICS

- Problems of Ametropia
- Retinoscopy
- Subjective refraction
- Balancing method of subjective refraction
- Near vision tests & refraction
- Tests for binocular vision
- Keratometry
- Routine eye examination
- Accommodation – convergence relationship
- Methods of accommodation & convergence measurement
- Myopia
- Hypermetropia
- Astigmatism I–Simple
- Astigmatism II–Compound
- Aphakia and pseudophakia
- Presbyopia
- Prismatic corrections
- Anisometropia

- Near point and far point
- Refractive consideration of near & far point

Section II: VISUAL OPTICS (BASIC & APPLIED)

- Optical system of the eye, Schematic & reduced eye
- Retinal image formation and size
- Visual acuity and factors affecting it
- Depth of focus
- Emmetropia & ametropia
- Spherical and astigmatic ametropia
- Presbyopia
- Refractive variations with age
- Optics of Contrast Sensitivity
- Binocular vision
- Corrective Lenses
- Ocular and spectacle refraction
- Convergence & divergence
- Visual fields
- Causes of refractive errors
- Objective measurement of visual acuity
- Uses of prisms
- Optics of Low Vision Devices
- Retinoscopy – Principles and methods
- Heterophoria and heterotropia

Paper-III: PHYSICAL, GEOMETRICAL AND INSTRUMENT OPTICS

Theory Marks	90
Internal Assessment	10 Marks

Practical Marks	90
Internal Assessment	10 Marks
Total Marks:	200
Pass Marks:	50%
Theory hours:	200
Practical Hours:	400
Total study hours:	600

Section I: PHYSICAL OPTICS

- Principles of Radiant Energy
- Emission spectra and black body
- Interference phenomenon
- Thin films, lens coating (interference)
- Polarization
- Diffraction: light distribution in images
- Color: Spectrum, primary, equations, incandescence
- Luminance
- Photometric principles, units, measurements
- Color temperature
- Photo-electric effect
- Photo-chemical effect

Section II: GEOMETRICAL OPTICS

- Reflection: Plane, spherical and parabolic mirror
- Refraction: Refractive index, Refraction at plane and spherical surfaces
- Spherical aberration
- Vergence and surface power, reduced vergence and reduced thickness
- Coaxial system of spherical surfaces
- Critical angle, total internal reflection, fiber optics,
- Prisms deviation dispersion and spectra

- Magnification
- Cylinder, sphere and toric surfaces
- Back and front vertex power
- Eye as a camera
- Optical characters of the eye

Section III: INSTRUMENT OPTICS

- Test Charts –
- Standard calculation of test charts
- Trial case lenses and accessories in the Trial Box
- Phoropter
- Trial frame design
- Retinoscope – types
- Retinoscope – optics
- Autorefractors – principles and use
- Direct ophthalmoscope
- Indirect ophthalmoscope
- Comparison of direct & indirect Ophthalmoscope
- Lensmeter
- Slit-lamp optics
- Slit lamp – methods of examination
- Glare and Contrast Sensitivity testing
- Potential Acuity Meter
- Stereo tests

Paper-IV: ORTHOPTICS, SQUINT AND LOW VISION

Theory Marks	90
Internal Assessment	10
Practical Marks	90
Internal Assessment	10
Total Marks:	200
Pass Marks:	50%
Theory hours:	200
Practical Hours:	400
Total study hours:	600

Section I: ORTHOPTICS & SQUINT

- Basic Terminologies uses in Squint / Orthoptics
- Binocular Single vision (sensory Requirements)
- Binocular Single vision tests
- Binocular Abnormalities
- Anomolic Retinal Correspondence
- Sensory Evaluation
- Motor Evaluation –
- Cover test (Different Types and Methods)
- Amblyopia –
- Esotropias – Congenital Esotropia
- Characteristics of Esotropias
- Accommodative Esotropia
- Accommodation & Convergence AC / A ratio
- Microtropia
- Strabismus Convergence Acutus
- Exotropias Types

- Exotropias Management
- A & V pattern + Penalization
- Synoptophore
- Hess screen
- Tangent Screen
- Duane's syndrome Type I
- Duane's Syndrome Type II & III
- Brown's Syndrome
- Miscellaneous syndrome (Jaw Winking, Mobius, FOEM, etc.)
- 3rd Nerve palsy
- 4th Nerve palsy (Superior Oblique Myochemia)
- 6th Nerve palsy
- DEP
- Dissociated Vertical Deviation (DVD)
- Myasthenia Gravis
- Multiple sclerosis
- Gravis Disease
- Nystagmus (Types)
- Nystagmus (Management)
- Prism Fusion Range
- Investigations of Incomitance Squint
- Trauma and Squint –
- Saccades Eye Movements –

Practical Aspects of Orthoptics Management & Practice

Section II: LOW VISION

- Epidemiology of Low Vision – Definitions and Global Situation
- Causes of Low Vision
- Patients History & Interview – Assessment tests
- Low Vision Assessment

- Essentials Supplementary tests – Color Vision, Visual Fields,
- Visual Acuity
- Magnification
- Low Vision Devices – Types
- EVD/EVP
- Optical Devices for distance use – Telescopes & Filters
- Optical Devices for near use – Magnifiers and their calculation –
- Electronic & High tech Low Vision Devices
- Low Vision Enhancement system – Video Presentation
- How to use Low Vision Devices
- Environmental Modifications – Special considerations
- Visual Training
- Low Vision Service Other Aspects of rehabilitation
- Motivation and client’s Behaviour
- Complication and side effects
- Services for the Blind
- Orientation and Mobility Training
- Braille
- Practical Training of LV Management Case Studies
- Practical Training of LV Management Case Studies
- Practical Training of LV Management Case Studies of the Blind Patients
- Practical Training of LV Management Case Studies of the Blind Patients

THIRD PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

PAPER I: OPHTHALMIC DISPENSING AND CONTACT LENSES

Theory Marks	90
Internal Assessment	10
Practical Marks	90
Internal Assessment	10
Total Marks:	200
Pass Marks:	50%
Theory hours:	100
Practical Hours:	200
Total study hours:	300

Section I: CONTACT LENSES

- Anatomy and Physiology of Cornea in relations to Contact Lens use
- The History of Contact lenses
- Cornea / Contact lens and Oxygen
- Basic Contact lens Types
- Indications and Contraindications of Contact lens use
- Contact Lens materials
- Contact Lens Manufacturing
- Optics of Contact lens
- Silicon Hydrogel Lenses
- Slit Lamp Biomicroscope
- Slit Lamp examination of Contact lenses patients – Indicators and Findings
- Astigmatism – Keratometer – Contact lenses
- Corneal Topography: measurement and Significance

- Contact lens verification
- Introduction of Contact lens Fitting – Soft Lenses
- RGP Lenses Fitting
- RGP Fitting Patterns
- Toric Lens Fitting
- Overview of care and Maintenance – method of disinfection
- Chemical Properties of contact lens care products
- Contact Lens Deposits
- Contact lens-related ocular complications Soft lens and their management
- Contact lens-related ocular complications RGP lenses and their management
- Diagnosis and management of Dry Eyes in contact lens wear
- Contact lens-related eye Problems –
- Contact lens Aftercare
- Fitting scleral lenses and an Ocular prosthesis
- Business aspects of Contact lenses practice
- Practice Management of Contact Lenses
- Inventory of Contact Lenses

Section II: OPHTHALMIC DISPENSING

- Ophthalmic Lenses, Types of lenses
- Definitions – lenses and frames
- Spectacle frame measurements
- Lensmeter and I.PD measurements
- Centration and decentration effective result
- Spectacles tints
- Vertex distance and vertex power
- Best form spectacle frames and lenses.
- Axis chart and its use in dispensing
- Lensmeter types and use
- Axis marking on Lensmeter

- Tools, Lens powering spherical
- Lens powering cylindrical
- Bifocals, Bifocals fitting, Bifocals dispensing
- Bifocals manufacturing
- Special purpose lenses, Progressive Lenses
- Different materials used in dispensing
- Pediatric dispensing, Special consideration for pediatric dispensing
- Prescription mistakes commonly made
- Auto Edger (Types and Fitting Methods)

PAPER II: OPHTHALMIC DISEASES AND PHARMACOLOGY

Theory Marks	90
Internal Assessment	10 Marks
Practical Marks	90
Internal Assessment	10 Marks
Total Marks:	200
Pass Marks:	50%
Theory hours:	100
Practical Hours:	200
Total study hours:	300

Section I: COMMON OPHTHALMIC DISEASES

- Diseases of the eye lids
- Diseases of the Conjunctiva
- Diseases of the Cornea
- Diseases of the Cornea
- Diseases of lens – Congenital anomalies
- Cataract
- Pupil Abnormalities
- Glaucoma
- Glaucoma
- Diseases of the Retina
- Uveitis
- Color Vision Defects
- Important eye syndromes
- Dry eye syndrome
- Defects of the visual pathway

- Visual cortex Problems
- Cortical Blindness
- Fundus examination & Optometric approach
- Related Systemic Diseases
- Congenital Diseases
- Multiple Sclerosis
- Myasthenia Gravis
- Retinopathy of Prematurity
- Albinisms
- Double Elevator palsy
- Trauma
- Introduction to Genetics –
- Hereditary Eye Disorders
- Hereditary Eye Disorders
- Diseases (Sign & Symptoms)
- Diseases (Sign & Symptoms)
- Diseases (Investigations)
- Diseases (Management & Counseling) –
- Cortical Blindness

Section II: OPHTHALMIC PHARMACOLOGY

- Introduction to ophthalmic pharmacology
- Passages of ophthalmic drugs
- Cycloplegics & mydriatics (mechanism of action)
- Uses of cycloplegics & mydriatics, side effects
- Antibiotics (introduction)
- Antibiotics (types & uses)
- Topical anesthetics
- Anti-allergic
- Anti-glaucoma drugs

- Steroids
- Anti-inflammatory drugs
- Adverse reactions and Side Effects – Antibiotic Drugs
- Adverse reactions and Side Effects – Anti Glaucoma Drugs, Beta Blockers
- Adverse Reactions of other Ophthalmic Drugs –
- Diagnostic Stains: Fluorescein, Rose Bengal

PAPER III: CLINICAL OPTOMETRY AND EXAMINATION

Theory	90
Internal Assessment	10
Practical	180
Internal Assessment	20
Total Marks:	200
Pass Marks:	50%
Theory hours:	100
Practical Hours:	200
Total study hours:	300

- Eye examination History & Symptoms
- Signs of diseases
- External examination
- Methods of examinations
- Approach & diagnosis with special emphasis on Case Studies
- Internal eye examination
- Management of patients (Routine)
- Management of practice (Occupational)
- How to run an optometric practice
- Merits & demerits:
- Marketing

PAPER IV: OCCUPATIONAL OPTOMETRY AND PREVENTIVE OPHTHALMOLOGY

Theory Marks	90
Internal Assessment	10 Marks
Practical Marks	90
Internal Assessment	10 Marks
Total Marks:	200
Pass Marks:	50%
Theory hours:	100
Practical Hours:	200
Total study hours:	300

Section I: OCCUPATIONAL OPTOMETRY

- Visual task analysis
- Visual anomalies
- VDUs and vision screeners
- Vision and aging
- Vision and driving
- Colour and colour coding
- Ocular hazards
- Protective eyewear and International Standards
- Terminology and calculations in illumination
- Lamps and lighting
- The Optician's Act
- Country Situation and Optometric Practice
- Optometric bodies
- Eye examination and dispensing
- Referral
- Record keeping and data protection

- English law including an introduction to European law
- Employment and consumer legislation and negligence
- International professional bodies in Optometry
- Marketing Optometric practice
- Management of Optometric practice
- Finance in Optometric practice

Section II: PREVENTIVE OPHTHALMOLOGY

- Primary eye Care introduction
- Prevention of Blindness basic Concepts and trends
- Measurement of diseases in the community
- Situation Analysis of existing resources for the prevention of Blindness
- Primary eye care management of cataract
- Primary eye care management of glaucoma
- Primary eye care management of diabetes
- Primary eye care VA Deficiency
- Primary eye care Refractive errors
- Primary eye care Childhood blindness
- Primary eye care Trauma
- Primary eye care Vision threatening diseases
- Primary eye care of ROP
- Primary eye care for Retinoblastoma

FINAL PROFESSIONAL B.SC OPTOMETRY AND ORTHOPTICS EXAMINATION

Paper I: PEDIATRIC OPTOMETRY

Theory Marks	90
Internal Assessment	10
Practical Marks	90
Internal Assessment	10
Total Marks:	200
Pass Marks:	50%
Theory hours:	100
Practical Hours:	200
Total study hours:	300

- Visual assessment
- Pre verbal assessment
- Verbal Assessment
- Refraction
- Development of Refractive Error
- Objective & Subjective methods
- Pre Verbal-Refracton
- Verbal Refraction
- Pediatric Low Vision
- Causes of Childhood Blindness – Need & Constraints
- LV management in Children
- Congenital Anomalies of the Eye:
- Problems affecting the Optical management and Visual Outcome
- Management Options
- Pediatric Contact lenses & Dispensing & Screening:
- Requirement & Management of Contact lenses in Children

- Understanding the Indication and Contraindications of Contact Lenses
- Dispensing of Glasses to Children – Problems and care

Paper II: OPHTHALMIC INSTRUMENTATION

Theory Marks	90
Internal Assessment	10
Practical Marks	90
Internal Assessment	10
Total Marks:	200
Pass Marks:	50
Theory hours:	100
Practical Hours:	200
Total study hours:	30

- Visual Field Loss and Pattern
- Equipment to assess Arc Perimeter
- Humphrey automated perimeter
- Goldman perimeter
- Keratometer and its use
- Corneal Topography
- FFA
- Biometry
- Ultrasound
- Fundus Photography
- YAG Lasers
- Bagline striated glasses, worth four dot test
- Prisms, Fresnel prisms

- Hess screen
- Tangent screen
- Synoptophore
- Electrophysiological tests – VER, ERG, EOG
-

Paper III: BIOSTATISTICS AND RESEARCH METHODS

Theory Marks	45
Internal Assessment	5
Oral Examination on Research Report	45
Internal Assessment	5
Total Marks	100
Pass Marks	50%
Theory Hours	100
Practical Hours:	200
Total study Hours:	300

1. **Introduction of Statistics:** Statistical data condensation of data, presentation of data by graphs, health-related data, rates and their relative importance, presentation of quantitative data.
2. **Sampling:** The concept of sampling, types and methods of drawing ideal sample, sampling distribution of the sample mean, error of sampling, standard error, chi-square, T-test and their uses in health.
3. **Central Tendency:** Concepts of central tendency, mean, median and mode and their value in health, percentiles, a measure of dispersion, coefficient of variation and skewness, normal distribution, range, standard deviation and relative deviation.
4. **Hypothesis:** Concepts of hypothesis testing, null & alternative hypothesis, two types of errors, acceptance & rejection regions, tow sided & one-sided tests, general steps in hypothesis testing, test about means, the confidence interval for the mean, meaning of significance in statistical procedures and methods of inferential statistics.

5. **Regression & Correlation:** Scatter diagram, straight line regression model, method of least squares, sample correlation coefficient, inference about regression coefficient and correlation coefficient.
6. **Introduction to Research:** The question of legitimate knowledge, knowledge & decision making, the scientific method, quantitative vs qualitative research, application of the scientific method, positivistic vs naturalistic paradigm.
7. **Classification of Research:** Basic vs applied research, evaluation research, research & development (R&D), action research.
8. **Selection & Formulation of a Problem:** From generic to a specific program, program statement, access to primary and secondary resources, note taking and information to management, Review of related literature, questions and/or hypothesis of the study.
9. **Development of a Research Plan:** The ethical, legal and professional obligations, the rationale of the study, the research plan, and evaluation of a research plan.
10. **Selection of sample:** sample & population, basic considerations in sampling, random sampling, stratified random sampling cluster sampling, systematic sampling determination of sample size, elimination of sampling bias.
11. **Instrumentation and Data Collection:** Tests and scales, objectivity and standardization, types of tests and scales, validity and reliability of an instrument, assessment of validity and reliability, development of tests/scale.
12. **Data Analysis & Interpretation:** Preparing data analysis, types of measurement scales, descriptive statistics, inferential statistics, using a computer for data analysis.
13. **Preparation of a Research Report:** Format & style, citation, references & bibliography writing theses, dissertations & journal articles.
14. **Research paper/ Report** writing related to the subject of interest of the student

RECOMMENDED BOOKS AND JOURNALS

1. Fundamental and Basic of Ophthalmology; 2005 AAO
2. Anatomy of the Eye (Snell's)
3. Optics and Refraction; 2005 AAO
4. Pediatric Ophthalmology and Strabismus Squint Section (2005 AAO)
5. Basic Refraction techniques;
6. Duke Elder; Practice of Refraction
7. Primary Eye Care procedures
8. Management of Strabismus and Amblyopia; John A Pratt Jhonson, Geraldine Tillson
9. Visual problems in Childhood by Terry Buckingham
10. Clinical Orthoptics
11. Duane's Ophthalmology (Squint Section)
12. Pediatric Ophthalmology by Kenneth Wright
13. Optometric management of Visually Handicapped by Helen Farrall
14. IACLE 10 - Courses of Contact lenses
15. Gay. L.R. (1987) Educational Research: Competencies for Analysis and Applications Columbus: Merrill.
16. Walpole, R.E.: Introduction to Statistic, Publishing Co. Inc, New York.
17. Spiegel, Murray R.: Theory & Problems of Statistics, Sehawm Publishing Co., New York.
18. PARK'S; Textbook of Preventive and Social Medicine