• Ophthalmic Technician Training Course
• Ophthalmic Nursing
• BSc (Hons) Vision Sciences
  Optometry/ Orthoptics/ Investigative Ophthalmic Technology
• Master in Community Eye Health (MCEH)
• Fellowship in Pediatric Ophthalmology
• Fellowship in Vitreo Retina
• M Phil leading to PhD (Vision Sciences)
THE QUAID’S MESSAGE
TO STUDENTS

The Duties Required Of Youth
Are
To Develop a Sound Sense
Of
Discipline, Character, Initiative
And
Solid Academic Background

THE QUAID’S MESSAGE

“Pakistan is proud of her youth, particularly the students who are nation builders of tomorrow. The duties required of youth are to develop a sound sense of discipline, character, initiative and a solid academic background. You must devote yourself whole heartedly to your studies, for that is your first obligation to yourselves, your parents and to the state. You must learn to obey for only then you can learn to command”.

Speech at Islamia College, Peshawar
(12th April, 1948)


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      iii. Investigative Ophthalmic Technology

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   i. Masters in Community Eye Health (MCEH)

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C. OUR VISION

“Eradication of all forms of blindness in Pakistan”

“(From province of Punjab in particular)”

D. OUR MISSION

“COAVS” shall lead from front in its Endeavour to contribute towards achieving Millennium Development Goals and working according to principles laid down in the VISION 2020---Right to sight for the elimination of all forms of avoidable blindness from Punjab & ultimately Pakistan

E. OUR PHILOSOPHY

We at college of Ophthalmology and allied vision sciences believe that:

- College of Ophthalmology and Allied Vision sciences, dedicated to excellence, make’s every effort to ensure provision of quality eye care to patient in Pakistan.
- We are committed to develop strategies for competent, holistic, safe, cost effective, preventive and curative eye care for an individual, family and community.
- Continuous education is essential for competence of staff, professional growth and development, both personal and organizational.
- Research should be fast to the extent possible and with acceptable guidelines for protection of human subject.
- We have responsibility to provide appropriate learning experience and to be role model for all students in various specialized discipline of eye health.
It is my pleasure to welcome you all to the College of Ophthalmology & Allied Vision Sciences (COAVS), King Edward Medical University / Mayo Hospital, Lahore, Pakistan, one of the most renowned institutions imparting ophthalmic education in Pakistan. COAVS made its modest start in a single room in May 1999 as comprehensive eye care cell (CEC Cell). In 2004 it was raised to the status of Punjab Institute of Preventive Ophthalmology (PIPO). With the addition of Post Graduate and Sub Specialty classes in 2007 re-designated as College of Ophthalmology and Allied Vision Sciences (COAVS).

The Objective of COAVS is elimination of all forms of avoidable blindness from Punjab & ultimately Pakistan and to achieve the goals of Vision 2020 “The Right to Sight.”. COAVS is struggling to achieve these targets through Humane Resource Development (HRD), District Comprehensive Eye Care Program (DCECP), disease control projects and awareness campaigns.

COAVS works on the guidelines given by the National Committee for Eye Health (NCEH) and makes strategies for up gradation and provision of quality but affordable Eye health services to the poor at their door steps.
COAVS is attached with King Edward Medical University and Mayo Hospitals Lahore and the courses are approved by Pakistan Medical & Dental Council, King Edwards Medical University, Pakistan Nursing College Council and Punjab Medical faculty.

G. BRIEF HISTORY OF COAVS

College of Ophthalmology and Allied Vision Sciences, (COAVS) starting its journey in a single room as Comprehensive Eye Care Cell (CEC Cell) at Mayo Hospital Lahore in 1999, has rapidly evolved into the most renowned and well-recognized teaching centers in the country, imparting education in the fields of Ophthalmology & Vision Sciences. It is attached with King Edward Medical University & Mayo Hospital.

Up to December 1998 no step was ever taken to improve the ophthalmic services at district level. In December 1998, Prof Asad Aslam Khan in collaboration with Fred Hollows Foundation conducted a detailed situational analysis of ophthalmic services available at district level in Punjab. The analysis revealed that the number of ophthalmologists was much less than the required number and no trained ophthalmic paramedic or ophthalmic nurse was available at district level. There was no sub-specialty unit e.g. vitreo retina or pediatric ophthalmology even in any of the teaching hospital. In many districts the ophthalmologists were not trained for microsurgery and intraocular lens implantation & the surgical rate in some of the districts was as low as 100 per year.

In response to the report of the situation analysis, with the intention to improve eye health services in the province, the Punjab health department established a comprehensive eye care cell (CEC Cell) at Mayo Hospital. The CEC cell accomplished various projects for Prevention of Blindness. In 2004, Government of the Punjab with the addition of teaching faculty for mid level eye care workers, upgraded it to Punjab Institute of Preventive Ophthalmology (PIPO) to eradicate preventable blindness from the country, particularly from the province of Punjab, and to achieve the goals of Vision 2020 – “The Right to Sight.” This institute was commissioned in a record period of six months. The total cost of the project was Rs. 54.50 million, of which Government of the Punjab contributed Rs. 27.84 million for the construction, whereas the remaining amount was provided by International NGO’s, WHO and Philanthropists in the form of equipment, furniture and vehicles.

Observing the tremendous success & achievements of Punjab Institute of Preventive Ophthalmology (PIPO) & in view to start postgraduate & subspecialty courses in Ophthalmology & Vision Sciences, Government of the Punjab, in 2007, elevated PIPO to College of Ophthalmology & Allied Vision Sciences (COAVS), The objectives was to eradicate preventable blindness from the country and to achieve the goals of Vision 2020 – “The Right to Sight.”
These targets are to be achieved through:

1. Human Resource Development
2. District Comprehensive Eye Care Programs
3. Disease Control Projects / Programs
4. Continuous Medical Education in Ophthalmology & Allied Vision Sciences
5. Awareness Campaigns

The basic aims and objectives however, have not changed; rather the scope of functioning of the college has broadened with the starting of new courses & launching of new projects.

Major partners of the college are INGOs e.g. Sight savers UK, Aus-Aid, Fred Hollows Foundation Australia, Irish Aid, & Christoffelblinden Mission (CBM) Germany / CHEF International. In addition Government of Pakistan, Government of the Punjab, World Health Organization (WHO), corporate partners like Standard Chartered Bank and individual Philanthropists have also contributed considerably.

**H. ACCREDITATIONS**

*The College of Ophthalmology and Allied Vision Sciences over the period of five years has been accredited by the following bodies for its relevant courses,*

1. Pakistan Medical and Dental Council *(PM&DC)*
2. King Edward Medical University, Lahore *(KEMU)*
3. College of Physician and Surgeons Pakistan *(CPSP)*
4. Pakistan Nursing Council
5. Punjab Medical Faculty
<table>
<thead>
<tr>
<th>Sr.#</th>
<th>Course Name</th>
<th>Duration</th>
<th>Eligibility</th>
<th>Accredited by</th>
<th>Important dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ophthalmic Technician</td>
<td>One Year</td>
<td>FSc (Pre Med) or Matric with Science</td>
<td>Punjab Medical Faculty</td>
<td>Course are advertised in Mid October Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td>2</td>
<td>Ophthalmic Nursing</td>
<td>One Year</td>
<td>Four year Nursing Diploma</td>
<td>Post Graduate College of Nursing</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td>3</td>
<td>BSc (Hons) Vision Sciences</td>
<td>Four Year</td>
<td>FSc (Pre Medical)</td>
<td>King Edward Medical University</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td></td>
<td>I. Optometry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II. Orthoptics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>III. Investigative Ophthalmic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Masters in Community Eye Health (MCEH)</td>
<td>Two Year</td>
<td>MBBS With One year House Job</td>
<td>King Edward Medical University</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td>5</td>
<td>Fellowship in Pediatric Ophthalmology</td>
<td>Two Year</td>
<td>MS/ FCPS/FRCS or equivalent</td>
<td>King Edward Medical University</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td>6</td>
<td>Fellowship in Vitreo Retina</td>
<td>Two Year</td>
<td>MS/ FCPS/FRCS or equivalent</td>
<td>King Edward Medical University &amp; CPSP</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
<tr>
<td>7</td>
<td>M Phil Leading to PhD</td>
<td>Five Years</td>
<td>BSc (Hons) in respective subject</td>
<td>King Edward Medical University</td>
<td>Admission completed mid December Classes start in first week of January</td>
</tr>
</tbody>
</table>
K. FACULTY

The faculty of the College consists of experienced staff well versed in Clinical as well as Preventive Ophthalmology. The Eye Unit III of Mayo Hospital Lahore / King Edward Medical University is attached with COAVS. The staff of Eye Unit III works in COAVS & vice versa.

The faculty comprises of;

1. Professor of Ophthalmology Unit III, King Edward Medical University Lahore, who is ex officio Principal/ Director General of COAVS
2. Associate Professor Preventive Ophthalmology
3. Assistant Professor Preventive Ophthalmology
4. Assistant Professor Investigative Oculist
5. Assistant Professor Pediatric Ophthalmology
6. Assistant Professor Vitreo-Retina
7. All the teaching & non-teaching staff of Eye Unit III attached with COAVS
8. Community Ophthalmologists
9. Nursing Instructors
10. Optometrists
11. Orthopist
12. Investigative Oculist/Investigative Ophthalmic Technologist
13. Epidemiologist
14. Visiting National/ International Faculty
15. Visiting Low Vision Advisor

L. FACILITIES AVAILABLE

Eye Unit-III, Institute of Ophthalmology Mayo Hospital Lahore is attached to COAVS for the purpose of training as clinical facility

The following facilities for the training in different disciplines of Ophthalmology program have been developed at COAVS and Institute of Ophthalmology

1. Diagnostic Department
   a. A & B Scan
   b. OCT
   c. FFA
   d. ERG
   e. HRT
   f. Visual Fields
   g. Pachymeter
   h. Spectroscopy
2. **Pediatric Ophthalmology Department**
   
   Out Patient Department
   
   a. Two fully equipped Consultation Rooms
   b. Orthoptics Room (Another Orthoptics Room is also being Equipped)
   c. Pediatric Refraction Room
   d. Children playing area
   
   Well equipped exclusive Pediatric Operation Theater

3. **Vitreo Retina Department**
   
   Out Patient Department
   
   a. Two well equipped Consultation Rooms
   b. Diabetic Retinopathy Screening Clinic
   
   Well equipped exclusive Vitreo Retina Operation Theater

4. **Laser Training Center**

5. **Wet Lab**

6. **Glaucoma Clinic**

7. **Cornea Bank**

8. **Computer Lab**

9. **Learning Resource Center**

   Having latest print, audio visual system in library with internet and Photostat facility

10. **Refraction Skill Laboratory**

11. **Air Conditioned Class Rooms with Multimedia**

   Separate class rooms for OTTC, Ophthalmic Nursing, B.Sc. (Hons) Vision Sciences, MCEH and Fellowship Programs.

12. **Auditorium**

13. **Conference Room**

14. **Research Center**

15. **Optical Laboratory**

**M. ACADEMIC PROGRAMS**

   a) Diploma Courses
   b) Degree Courses
   c) M Phil Level Program
   d) Subspecialty Development Programs
   e) M Phil Leading to PhD.
a) DIPLOMA COURSES

i) OPHTHALMIC TECHNICIAN TRAINING COURSE

*Ophthalmic Technician-Training Course* of one-year duration, started in the tenure of the CEC Cell in 2001 & is continuing at COAVS. The diploma for this course is awarded by The Punjab Medical Faculty.

### SEATS DISTRIBUTION

<table>
<thead>
<tr>
<th>Ophthalmic Technician Training Course (OTTC)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Merit</td>
<td>30</td>
</tr>
<tr>
<td>Sind</td>
<td>02</td>
</tr>
<tr>
<td>Baluchistan</td>
<td>04</td>
</tr>
<tr>
<td>Khyber Pakhtoonkhwa &amp; FATA</td>
<td>02</td>
</tr>
<tr>
<td>Azad J &amp; Kashmir</td>
<td>02</td>
</tr>
<tr>
<td>Gilgit Baltistan</td>
<td>02</td>
</tr>
<tr>
<td>Foreign Students</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
</tr>
</tbody>
</table>

- Foreign students will apply through Economics Affairs Division (EAD) of the Federal Government.

### OBJECTIVES

The Ophthalmic Technician should be able to:-

- Recognize and manage most of the common diseases.  *(Group “A” Diseases)*
- Recognize and initiate treatment for some of the diseases and refer them to an Ophthalmologist  *(Group “B” Diseases)*
- Execute follow up eye care to patients with acute and chronic eye diseases.(as advised by the Ophthalmologist)  *(Group “A” Diseases)*
- Give first level management to ocular emergencies.  *(Group “C” Diseases)*
CURRICULUM

PHASE – I
The principle objective of this part is to give the student a basic understanding of the form and the way the eye functions as a unit.

Phase – II
All topics covered in Phase – I will continue in Phase – II with more emphasis on:
- Examination of the patients. Recognize and initiate treatment for some of the diseases and refer them to an Ophthalmologist (Group “B” Diseases)
- Execute follow up eye care to patients with acute and chronic eye diseases as advised by Ophthalmologist. (Group “A” Diseases)
- Give first level management to ocular emergencies (Group “C” Diseases)

ANATOMY AND PHYSIOLOGY OF THE EYE (27 HRS)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Hrs</th>
<th>Teaching / Learning Strategies</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy of Human Eye</td>
<td>1 hr</td>
<td>Lectures, Slides. Models.</td>
<td>Quiz</td>
</tr>
<tr>
<td>Adnexa: To know about the structure of Eye Lid</td>
<td>2 hrs</td>
<td>Lecture, Discussion, Slides, Models &amp; Practical. Demonstrations.</td>
<td>Quiz</td>
</tr>
<tr>
<td>Lachrymal System</td>
<td>1 hr</td>
<td>Lectures, Slides. Models.</td>
<td>Quiz</td>
</tr>
<tr>
<td>Orbit</td>
<td>1 hr</td>
<td>Lectures, Slides. Models.</td>
<td>Quiz</td>
</tr>
<tr>
<td>Eye Ball</td>
<td>19 hrs</td>
<td>Lectures. Slides. Models.</td>
<td>Quiz</td>
</tr>
<tr>
<td>Contents of Eye Ball</td>
<td>3 hrs</td>
<td>Lectures. Slides. Models.</td>
<td>Quiz</td>
</tr>
</tbody>
</table>

OCULAR EXAMINATION TECHNIQUES AND DIAGNOSTIC TESTS (40 HRS)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Hrs</th>
<th>Teaching / Learning Strategies</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Learn to take an accurate and concise history from patient</td>
<td>10 hrs</td>
<td>Lectures, Slides, Video film. Demonstration on indoor &amp; OPD</td>
<td>Practically on patients.</td>
</tr>
<tr>
<td>I. Ocular Examination Techniques</td>
<td>5 hrs</td>
<td>Lectures, Slides, Video film. Demonstration on indoor &amp; OPD</td>
<td>Practically on patients.</td>
</tr>
<tr>
<td>II. Diagnostic Tests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Should be able to do Ophthalmoscopy</td>
<td>2hrs</td>
<td>Doing the procedure on patients.</td>
<td>Practically on patients.</td>
</tr>
<tr>
<td>I. Would be able to check intraocular pressure</td>
<td>5 hrs</td>
<td>Checking intraocular pressure repeatedly. Doing it on patient</td>
<td>Quiz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
i. To know anterior segment photography and fundus photography
   Lectures, Slides, Video film. Demonstration on patients in & out patients.
   Practically on patients.

II. Maintenance and operation of Slit lamp, Laser and ECG Machine

DISEASES AND DISORDERS OF THE EYE

Medical Ophthalmology

Group “A” Diseases and Disorders

Ophthalmic Nursing (40 Hrs)
Ocular Pharmacology (16 Hrs)

Besides these topics the student will also be taught.

Communication Skill (12 Hrs)
Patients Psychology (10 Hrs)
Community Eye Health (42 Hrs)
Basic Epidemiology and Statistics (12 Hrs)
Record Keeping (12 Hrs)

EXAMINATION AFTER ONE YEAR BY THE PUNJAB MEDICAL FACULTY

<table>
<thead>
<tr>
<th>THEORY PAPER “A” (SHORT ESSAY QUESTIONS)</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEORY PAPER “B” (MCQS)</td>
<td>100</td>
</tr>
<tr>
<td>INTERNAL ASSESSMENT</td>
<td>100</td>
</tr>
<tr>
<td>VIVA</td>
<td>100</td>
</tr>
<tr>
<td>TOTAL MARKS</td>
<td>400</td>
</tr>
</tbody>
</table>

ii) DIPLOMA IN OPHTHALMIC NURSING

College of Ophthalmology and Allied Vision Sciences has launched one year Diploma in Ophthalmic Nursing to improve the Eye Health Care. After the successful completion of this course, the future Ophthalmic Nurses is expected to attain enough knowledge and technical skill to perform their desired function, so as to work along with the Ophthalmologist in a team.

INSTRUCTIONAL OBJECTIVES OF THE PROGRAM

The Educational Program will be aimed to produce a driven professional and a good human being, and it will develop general and subject specified competencies.
GENERAL COMPETENCIES: Ideology and Faith, respectful and sympathetic, good morals and honest, team worker, well oriented, having spoken and written Communication Skills, Computers and Information Technology.

SUBJECT SPECIFIED COMPETENCIES: Educational objectives (attainments) are arranged in all three domains of learning, i.e., Cognitive Domain (Knowledge), Psychomotor Domain (Technical Skills), and Attitudes. These attainments are stated in all modules of learning in a way that their attainment level could be measured in terms of assessments.

LEARNING STRATEGIES

i) Student centered in small groups
ii) Problem Based Learning
iii) Task Based Learning
iv) Systematic Training.

ACADEMIC BLOCKS

- Two semesters in one year, each semester of 20 weeks
- First semester (50% of total time) comprises mainly of theory classes
- Second semester consists of practical training

ADMISSION CRITERIA

- 4-year Diploma in General nursing registered with Pakistan Nursing Council.
- Experience of at least three years after nursing diploma as charge nurse in a recognized Hospital
- Foreign students will apply through Economics Affairs Division (EAD) of the Federal Government.

<table>
<thead>
<tr>
<th>SEAT DISTRIBUTION OF OPHTHALMIC NURSING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Merit</td>
</tr>
<tr>
<td>Sind</td>
</tr>
<tr>
<td>Baluchistan</td>
</tr>
<tr>
<td>Khyber Pakhtoonkhwa &amp; FATA</td>
</tr>
<tr>
<td>Azad J &amp; Kashmir</td>
</tr>
<tr>
<td>Gilgit Baltistan</td>
</tr>
</tbody>
</table>
## COURSE CURRICULUM

### First Semester

<table>
<thead>
<tr>
<th>MODULE</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I – A</td>
<td>Foundation Course</td>
</tr>
<tr>
<td>I – A.1</td>
<td>Nursing theory &amp; practice</td>
</tr>
<tr>
<td>I – A.2</td>
<td>Biological sciences (Ophthalmology related)</td>
</tr>
<tr>
<td>I – A.3</td>
<td>Communication skills</td>
</tr>
<tr>
<td>I – A.4</td>
<td>Teaching skills</td>
</tr>
<tr>
<td>I – A.5</td>
<td>Ethical Issues</td>
</tr>
<tr>
<td>I – A.6</td>
<td>Research</td>
</tr>
<tr>
<td>II – A</td>
<td>TITLE</td>
</tr>
<tr>
<td>II– A.1</td>
<td>Nursing theory &amp; practice</td>
</tr>
<tr>
<td>II– A.2</td>
<td>Biological Sciences – Disordered physiology</td>
</tr>
<tr>
<td>II– A.3</td>
<td>Ophthalmic Microbiology</td>
</tr>
<tr>
<td>II– A.4</td>
<td>Ophthalmic Pharmacology</td>
</tr>
<tr>
<td>II– A.5</td>
<td>Communication skills</td>
</tr>
<tr>
<td>II– A.6</td>
<td>Health Education</td>
</tr>
<tr>
<td>II– A.7</td>
<td>Teaching skills</td>
</tr>
<tr>
<td>II– A.8</td>
<td>Ethical issues</td>
</tr>
<tr>
<td>II– A.9</td>
<td>Research</td>
</tr>
</tbody>
</table>

### MODULE – I

1. **Nursing Theory & Practice**
   
   a) Causes – Organisms – Environment
   
   b) Pharmacology Theories & Models of Nursing:
      - Introduction & definitions
      - Concept of Models
      - Types
      - Application
   
   c) Developments in Nursing:
- Individual Patient Care
- Primary Nursing – Accountability

d) Pakistan Nursing Council & Examination Board proposals & roles:
- Health service structure – reports
- Implications for practice

e) Health Education – Concept of Health:
- Definitions
- Role of the Nurse
- Philosophies – Resources
- Cultures

2. Biological Sciences
   a) Physiology:
      - Structure & Function of the eye
      - Normal Function

3. Microbiology
   a) Control of Infection

4. Pharmacology
   a) Legislation – Local/ National
   b) Ordering, Storing & Administering Drugs
   c) Patient’s Rights – Consent/ Choice

5. Communications Skills
   a) How individuals communicate
   b) Verbal/ Non-Verbal Communication
   c) Communication with patients who are anxious

6. Teaching Skills
   a) How individuals learn
   b) Teaching and learning strategies
   c) Setting aims
   d) Feedback

7. Ethical Issues
   a) Ethics – Moral Philosophy/ Definition
   b) Values & Judgments
   c) Issue of Right & Wrong
   d) Society – Profession, Culture, Religion, Self etc.

8. Research
   a) Definitions
      - Scientific – Observational
      - Historical – Descriptive
- Quantitative – Qualitative
  b) Importance to Nursing Education & Practice
  c) The steps in the Research Process/ Methodology
  d) Literature search after choosing topic or area.

**MODULE – II**

1. **Nursing Theory & Practice**
   a. The role of Ophthalmic Nurse
   b. Individual Patient Care
   c. Assessment Skills – Problem Solving, Care.
   d. The Law and the Nurse – Accountability
   e. Professional Development – Personal Responsibility
   f. Policies and Procedures

2. **Biological sciences – disordered physiology**
   a. The Theory of Sight; Visual Acuity; Adult/Child
   b. Types of Vision (Central, Distance, Near, Color, Peripheral)
   c. Ocular Muscles
   d. Refractive errors & their correction
   e. Presbyopia, astigmatism, strabismus, lacrimal sac washout.
   f. Removal of sutures – cornea – conjunctiva
   g. Retinal functions & disorders
   h. Laser, ultrasound, tonometry, fluorescence angiography.
   i. Injuries to eye
   j. Conjunctivitis
   k. Ophthalmia neonatorum
   l. Trachoma
   m. Corneal ulcer
   n. Glaucoma

3. **Microbiology**
   a. Departmental environment
   b. Asepsis role – infection control nurse.
   c. Hand washing; gloves/equipment

4. **Pharmacology**
   a. Drugs used in OPD & minor operations.
   c. Nurse’s role.

5. **Communication Skills**
b. Importance of touch/ sound  
c. Handling anxious/ aggressive patient.  
d. Stress in patients/ staff.  
e. Courtesy & empathy with patients and relatives.

6. **Community Based Ophthalmic Nursing**  
   a. Conducting community surveys  
   b. Handling of epidemics of ophthalmic diseases

7. **Health Education**  
   a. Environmental dangers  
   b. Eye care – progressive diseases e.g. diabetic retinopathy, cataracts.  
   c. Regular screening – resources.  
   d. Role of the nurse – ethnic minorities, the elderly, the disadvantaged.

8. **Teaching Skills**  
   a. Teaching patients/ clients/ relatives about drug administration, healthy practices.  
   b. Instillation of eye drops.  
   c. Strategies, reinforcement, evaluation.

9. **Ethical Issues**  
   a. Patients’ /relatives’ rights.  
   b. Staffing levels/ supervision  
   c. Blood tests – transplants

10. **Research**  
    a. Areas appropriate to nursing research e.g. waiting time, information giving, patients’ / relatives’ privacy, nursing care.

**SECOND SEMESTER**  
Clinical work

**COURSE CURRICULUM FOR THE SECOND SEMESTER**  
(Clinical Training/ Internship)

**MODULE – III**  
At the end of Module III, the nurse will have an increased knowledge and understanding of management of the ophthalmic ward/ operation Theatre/ OPD.

**Objectives**  
The course member will be able to:  
1. Discuss the holistic approach to individual patient care and assess the specific indication of physical and psychological response.  
2. Discuss the methods of teaching suitable for patients/ relatives.  
3. Demonstrate the management of the ward (under supervision) in relation to:
a. Quality of ophthalmic nurse, - Duty off, Communications skills & difficulties
b. Interpersonal relationships, Decision making
4. Discuss the disordered physiology of:
   Lids & lacrimal system, Uveal tract, Conjunctivitis, Optic nerve pathway, Glaucoma and
   Vascular diseases of the eye
5. Discuss the aseptic technique
6. Discuss the drugs used in ophthalmic disorders: Dosage & administration, action, side effect
   and drug interaction.
7. Have better knowledge of systemic drugs used in ophthalmic patients

GENERAL RULES & REGULATIONS FOR ASSESSMENTS
♦ Each semester will end up in semester assessment, conducted by the course in charge.
♦ The Nursing college will conduct final examination on successful completion of two
   Semesters
♦ Minimum of 50% marks will be required to pass the examination.
♦ A candidate has to pass in written & viva voce individually to qualify for passing.
♦ At successful completion of first semester the candidate will move to the 2nd semester.
♦ The students will be allowed to take only one semester at a time
♦ Candidates who fail in both semesters will not be allowed to appear in the final
   examination.

CALENDAR OF ASSESSMENTS OF EACH SEMESTER

<table>
<thead>
<tr>
<th>Semester</th>
<th>Assessment Type</th>
<th>Contents</th>
<th>Semester Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Theory Paper I</td>
<td>1. Basic Med. Sciences</td>
<td>50</td>
</tr>
<tr>
<td>I</td>
<td>Theory Paper II</td>
<td>2. Nursing Theory &amp; practice</td>
<td>50</td>
</tr>
<tr>
<td>II</td>
<td>Paper-I</td>
<td>1. Basic Skills</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marks (%)</th>
<th>Grades</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-59</td>
<td>D</td>
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</table>

MARKS, GRADES & GRADE POINTS
<table>
<thead>
<tr>
<th>Range</th>
<th>Grade</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>60-64</td>
<td>C</td>
<td>1.5</td>
</tr>
<tr>
<td>65-69</td>
<td>C+</td>
<td>2</td>
</tr>
<tr>
<td>70-74</td>
<td>B</td>
<td>2.5</td>
</tr>
<tr>
<td>75-79</td>
<td>B+</td>
<td>3</td>
</tr>
<tr>
<td>80-84</td>
<td>A</td>
<td>3.5</td>
</tr>
<tr>
<td>85-100</td>
<td>A+</td>
<td>4</td>
</tr>
</tbody>
</table>
b) GRADUATE COURSES

- BSc. (Hons) Vision Sciences (Optometry)
- BSc. (Hons) Vision Sciences (Orthoptics)
- BSc. (Hons) Vision Sciences (Investigative Ophthalmic Technology)

These programs cover all the aspects of the Vision Sciences over a period of 4 years. First year is dedicated to teaching Basic Medical & Biomedical Sciences while second year will be reserved for Basic Ophthalmic Sciences. Third year is reserved for Applied Ophthalmic Sciences/ Refraction. In the fourth year the candidates on merit have the chance to opt for Optometry, Orthoptics, or Investigative Ophthalmic Technology.

STATUTES (FRAMEWORK)

These graduates in Vision & Allied Health Sciences, being different from Medical Graduates, will not be allowed to practice art of medicine independently in a way to prescribe treatment or perform any surgical procedure. However, at the end of successful completion of these Programs, they are expected to attain enough knowledge and technical skills to perform their desired function so as to assist the Ophthalmologist e.g. the optometrist can prescribe glasses & contact lens, Orthopist can diagnose cases with squint & suggest treatment whereas Investigative Oculist can assist in various diagnostic ophthalmic procedures such as Fundus photography, Ultrasound, ERG, OCT etc.

TITLE OF THE QUALIFICATIONS

B.SC. (HONS) VISION SCIENCES

i) Optometry
ii) Orthoptics
iii) Investigative Ophthalmic Technology

DURATION

Duration of course will be four (4) years.

ADMISSION CRITERIA

- FSc. (Pre-medical) / Equal qualification
- Age 18 to 23 years
Foreign students will apply through Economics Affairs Division (EAD) of the Federal Government.

<table>
<thead>
<tr>
<th>SEAT DISTRIBUTION OF Bsc (HONS) VISION SCIENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Merit (Punjab)</td>
</tr>
<tr>
<td>Sind</td>
</tr>
<tr>
<td>Baluchistan</td>
</tr>
<tr>
<td>Khyber Pakhtoonkhwa</td>
</tr>
<tr>
<td>Azad Jammu &amp; Kashmir</td>
</tr>
<tr>
<td>Gilgit &amp; Baltistan</td>
</tr>
<tr>
<td>Foreigners</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

**ACADEMIC CALENDAR**

- Total Duration : 4 Academic Year
- 1st two years (Phase I) : 4 Semesters
- Each Semester : 20 weeks

During Phase – I: - Theoretical Learning 60% & Practical Learning 40%

- 3rd & 4th year (Phase II) : Annual Examination
- Academic Year Duration : 46 weeks
- Instructions (Lectures) : 20% Time
- Seminars (Discussions) : 10% Time
- Practical Training (Hospital/Labs) : 60%
- Supervised Self Learning : 10%

**PROGRAM OUTLINE**

**Phases of Studies in Basic Curriculum**

- Basic Sciences & Pre-Clinical: 03 Years
- Major specialty: 01 Years
YEARLY PROGRAM SCHEDULE

**FIRST SEMESTER**
Teaching: 18 weeks (January 1st – June 15th)
Review and Evaluation: 02 weeks
Total: 20 weeks

*Summer Recess (June 16th – July 15th)*

**SECOND SEMESTER**
Teaching: 18 weeks (July 16th – December 20th)
Review and Evaluation: 02 weeks
Total: 20 weeks

*Winter Recess (December 21st – December 31st)*

INSTRUCTIONAL CONTENTS OF THEORY & PRACTICAL LEARNING

**YEAR I  SEMESTER – I**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum of Semester – I</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>M 1001</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Physiology</td>
<td>M 1002</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Biochemistry</td>
<td>M 1003</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pharmacology &amp; Toxicology</td>
<td>M 1004</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pathology</td>
<td>M 1005</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Public &amp; Preventive Health</td>
<td>M 1006</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Forensic Medicine</td>
<td>M 1007</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Principles of Medicine</td>
<td>M 1008</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Principles of Surgery</td>
<td>M 1009</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Behavioral Sciences &amp; Ethics</td>
<td>M 1010</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Computer Literacy</td>
<td>M 1011</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>M 1012</td>
<td>2</td>
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<tr>
<td><strong>Total</strong></td>
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### Instructional Contents of Theory & Practical Learning

#### YEAR I SEMESTER – II

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum of Semester – II</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>Biostatistics, Epidemiology &amp; Research</td>
<td>M 1013</td>
<td>2</td>
</tr>
<tr>
<td>Phase I</td>
<td>Physics</td>
<td>M 1014</td>
<td>3</td>
</tr>
<tr>
<td>Phase I</td>
<td>Materials &amp; Biomaterials</td>
<td>M 1015</td>
<td>3</td>
</tr>
<tr>
<td>Phase I</td>
<td>Principles of Mechanics</td>
<td>M 1016</td>
<td>3</td>
</tr>
<tr>
<td>Phase I</td>
<td>Computer Controls, Information Technology, &amp; Automation</td>
<td>M 1017</td>
<td>2</td>
</tr>
<tr>
<td>Phase I</td>
<td>Biotechnology</td>
<td>M 1018</td>
<td>1</td>
</tr>
<tr>
<td>Phase I</td>
<td>Principles of Civil Engineering</td>
<td>M 1019</td>
<td>2</td>
</tr>
<tr>
<td>Phase I</td>
<td>History / Pakistan Studies</td>
<td>M 1020</td>
<td>1</td>
</tr>
<tr>
<td>Phase I</td>
<td>Islamiat / Ethics</td>
<td>M 1021</td>
<td>1</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

### INSTRUCTIONAL CONTENTS OF THEORY & PRACTICAL LEARNING

#### YEAR II SEMESTER – III

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum of Semester – III</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>Ocular Anatomy</td>
<td>M 2001</td>
<td>3</td>
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<tr>
<td>Phase I</td>
<td>Ocular Physiology</td>
<td>M 2002</td>
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<tr>
<td>Phase I</td>
<td>Ocular Pharmacology</td>
<td>M 2003</td>
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<tr>
<td>Phase I</td>
<td>Ocular Pathology</td>
<td>M 2004</td>
<td>3</td>
</tr>
<tr>
<td>Phase I</td>
<td>Epidemiology</td>
<td>M 2005</td>
<td>2</td>
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<tr>
<td>Course</td>
<td>Year</td>
<td>Weeks</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
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</tr>
<tr>
<td>Communication Skills</td>
<td>M 2006</td>
<td>1</td>
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<tr>
<td>Basic Clinical Functions &amp; Skills</td>
<td>M 2007</td>
<td>3</td>
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<tr>
<td>Ophthalmic Nursing</td>
<td>M 2008</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
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Instructional Contents of Theory and Practical Learning

YEAR II  SEMESTER – IV

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum of Semester – IV</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>Basic Optics &amp; Refraction</td>
<td>M 2014</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Geometrical Optics</td>
<td>M 2015</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Physical Optics</td>
<td>M 2016</td>
<td>3</td>
</tr>
<tr>
<td>Phase II</td>
<td>Advanced Visual Optics</td>
<td>M 2017</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Advanced Visual Functions</td>
<td>M 2018</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Practical Training in OPD</td>
<td>M 2019</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
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</table>

Instructional Contents of Theory and Practical Learning

YEAR – III

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase II</td>
<td>Primary Health Care &amp; Primary Eye Care</td>
<td>M 3001</td>
<td>1</td>
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<tr>
<td></td>
<td>Overview of Blindness and National Program for Prevention &amp; Control of Blindness in Pakistan</td>
<td>M 3002</td>
<td>1</td>
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<tr>
<td></td>
<td>Advanced Refraction &amp; Retinoscopy</td>
<td>M 3003</td>
<td>4</td>
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<tr>
<td></td>
<td>Avoidable &amp; Unavoidable Causes of Blindness</td>
<td>M 3004</td>
<td>1</td>
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<tr>
<td></td>
<td>Practical Retinoscopy</td>
<td>M 3005</td>
<td>6</td>
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<tr>
<td></td>
<td>Basic Dispensing Optics</td>
<td>M 3006</td>
<td>2</td>
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<tr>
<td></td>
<td>Ophthalmic Instruments &amp; their Maintenance</td>
<td>M 3007</td>
<td>2</td>
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<tr>
<td></td>
<td>Contact Lenses</td>
<td>M 3008</td>
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</table>
### Phase I

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
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<tbody>
<tr>
<td>Review of Basics of Vision and Optics</td>
<td>M 4101</td>
<td>2</td>
</tr>
<tr>
<td>Visual Sciences 1,2,3,4</td>
<td>M 4102</td>
<td>4</td>
</tr>
<tr>
<td>Binocular Vision &amp; its Clinical Application</td>
<td>M 4103</td>
<td>4</td>
</tr>
<tr>
<td>Clinical Optometry</td>
<td>M 4104</td>
<td>4</td>
</tr>
<tr>
<td>Dispensing Optics</td>
<td>M 4105</td>
<td>6</td>
</tr>
<tr>
<td>Contact Lenses</td>
<td>M 4106</td>
<td>4</td>
</tr>
<tr>
<td>Applied Statistics, Research Methodology &amp; Project</td>
<td>M 4107</td>
<td>4</td>
</tr>
<tr>
<td>OPD Training in Optometry</td>
<td>M 4108</td>
<td>8</td>
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</tbody>
</table>

**Total**                                                                                       |         | **36**|

### Instructional Contents into Theory and Practical Learning

**YEAR IV**

**OPTOMETRY**

### Phase II

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Modules</th>
<th>Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of Basics of Vision and Optics</td>
<td>M 4201</td>
<td>2</td>
</tr>
<tr>
<td>Visual Sciences 1,2,3,4</td>
<td>M 4202</td>
<td>4</td>
</tr>
<tr>
<td>Binocular Vision &amp; its Clinical Application</td>
<td>M 4203</td>
<td>4</td>
</tr>
<tr>
<td>Clinical Orthoptics</td>
<td>M 4204</td>
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</table>

**ORTHOPTICS**
<table>
<thead>
<tr>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispensing Optics</td>
<td>4</td>
</tr>
<tr>
<td>Applied Statistics, Research Methodology &amp; Project</td>
<td>4</td>
</tr>
<tr>
<td>OPD Training in Orthoptics</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

**Instructional Contents into Theory and Practical Learning**

**YEAR – IV**

**INVESTIGATIVE OPHTHALMIC TECHNOLOGY**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Curriculum</th>
<th>Modules</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase II</td>
<td>Introduction to investigative Ophthalmic Technology</td>
<td>M 4301</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Review of Biomedical Engineering</td>
<td>M 4302</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Specialized Diagnostic Procedures</td>
<td>M 4303</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Ophthalmic Microbiology</td>
<td>M 4304</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Eye Banking</td>
<td>M 4305</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Applied Statistics, Research Methodology &amp; Project</td>
<td>M 4306</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Practical Training</td>
<td>M 4307</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
<td></td>
</tr>
</tbody>
</table>

**EVALUATION**

**Formative Evaluation (Internal Evaluation)**

**MODULE ASSESSMENTS**

At the end of the Module each Module is evaluated by the Program Faculty Committee and the Marks are converted into Grade Points. At the end of the semester the Average Grade Point of all modules is calculated and at the end of the first phase, Cumulative Grade Point Average of all four semesters is calculated. During Phase-II, the Grade point Average of all modules is calculated at the end of year-3 and year-4, and 2nd Cumulative Grade Point Average is calculated at the end of Phase-II.

**LOG BOOK ASSESSMENT**

28
Log book of whole program is divided into each year and will be assessed and signed by the module in charge teacher at the end of each module.

**SUMMATIVE EVALUATION**

(University Evaluation)

**MID COMPREHENSIVE EXAMINATION**

The students, who qualify the four semesters, are eligible to appear in Mid Comprehensive Examination at the end of fourth semester, covering all modules of the programs taught during the semesters.

**END COMPREHENSIVE EXAMINATION**

The students who qualify the Mid Comprehensive Examination, and successfully pass the modules of year-3 and year-4 are eligible to appear for End Comprehensive Examination.

**ENTRY**

<table>
<thead>
<tr>
<th>Scheme of the Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I</strong> (2-Years)</td>
</tr>
<tr>
<td>Year I</td>
</tr>
<tr>
<td>Year II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mid Comprehensive Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase II</strong> (2-Years)</td>
</tr>
<tr>
<td>Year III</td>
</tr>
<tr>
<td>Year IV</td>
</tr>
</tbody>
</table>

| End Comprehensive Examination |

**EXIT**

**EXAMINATION PATTERN OF B.SC (HONS) VISION SCIENCES**

i) Optometry  
ii) Orthoptics  
iii) Investigative Ophthalmic Technology

**Mid Comprehensive Examination (At the End of 2nd Year)**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>TITLE OF PAPERS</th>
<th>PAPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Islamic Studies + Pakistan Studies</td>
<td>Paper I</td>
</tr>
<tr>
<td>02</td>
<td>Basic Ophthalmology</td>
<td>Paper II</td>
</tr>
</tbody>
</table>
End Comprehensive Examination

There will be three written papers and three practical sessions for each specialty. Paper-I will be common for all specialties however Paper-II and Paper-III will be apprehensive to their specialized fields.

The curriculum/ syllabus for the Theory, Oral and Practical Papers will be defined by the concerned Program Faculty Committee.

The details of examination are as follow:

**OPTOMETRY**

<table>
<thead>
<tr>
<th>Title</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Foundation of Vision Sciences</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Basic Optometry</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Clinical Optometry</td>
</tr>
<tr>
<td>Practical – I</td>
<td>TOACS</td>
</tr>
<tr>
<td>Practical – II</td>
<td>Viva Voce</td>
</tr>
<tr>
<td>Practical – III</td>
<td>Skill Assessment</td>
</tr>
</tbody>
</table>

**PAPER – I (Foundations Of Vision Sciences)**


**PAPER – II (Basic Optometry)**

Refraction, Optometric Instrumentation, Basic Orthoptics

**PAPER – III (Clinical Optometry)**

Contact Lenses, Dispensing Optics, Low Vision

**ORTHOPTICS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Foundation Of Vision Sciences</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Basic Orthoptics</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Clinical Orthoptics</td>
</tr>
</tbody>
</table>
Practical – I  TOACS  
Practical – II  Viva Voce  
Practical – III  Skill Assessment  

PAPER – I  (Foundations Of Vision Sciences)  

PAPER – II  (Basic Orthoptics)  
Introduction to Orthoptics, Foundation of Orthoptics, Medical Technology, Low Vision  

PAPER – III  (Clinical Orthoptics)  
Afferent System, Efferent System, Disorders and their Treatment  

INVESTIGATIVE OPHTHALMIC TECHNOLOGY  

<table>
<thead>
<tr>
<th>Title</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper – I</td>
<td>Foundation Of Vision Sciences</td>
</tr>
<tr>
<td>Paper – II</td>
<td>Retinal Investigations</td>
</tr>
<tr>
<td>Paper – III</td>
<td>Specialized Diagnostic Procedures</td>
</tr>
<tr>
<td>Practical – I</td>
<td>TOACS</td>
</tr>
<tr>
<td>Practical – II</td>
<td>Viva Voce</td>
</tr>
<tr>
<td>Practical – III</td>
<td>Skill Assessment</td>
</tr>
</tbody>
</table>

PAPER – I  (Foundations Of Vision Sciences)  

PAPER – II  (Retinal Investigations)  
Ultrasonography, Optical Coherence Tomography, Heidelberg Retinal Tomography, Fundus Fluorescein Angiography, Advanced Retinal and Choroidal Diseases.  

PAPER – III  (Specialized Diagnostic Procedures)  
Visual Fields, Biometry, Pachymetery, Corneal Banking, Electro-Retinogram, Visual Evoked Potential  

c) M Phil LEVEL PROGRAM  

i.  MASTERS IN COMMUNITY EYE HEALTH (MCEH)  

TITLE OF THE COURSE:  Masters in Community Eye Health (MCEH)
**DURATION:** Two academic years
- 1st year Two semesters
- 2nd year Clinical / field attachments & research / Dissertation.

<table>
<thead>
<tr>
<th>Seats Distribution</th>
<th>Masters in Eye Care Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Merit from Punjab</td>
<td>07</td>
</tr>
<tr>
<td>Other provinces</td>
<td>03</td>
</tr>
<tr>
<td>Northern Areas</td>
<td>01</td>
</tr>
<tr>
<td>AJK</td>
<td>01</td>
</tr>
<tr>
<td>Foreign students</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

Note: If no student qualifies for reserved quota seats, then the seats will be given to open merit.

**ELIGIBILITY:** (In order of preference)

a) MBBS or equivalent from a recognized institution with at least one year experience in Ophthalmology
b) MBBS or equivalent from a recognized university with at least six months experience in Ophthalmology and six months experience in General Medicine
c) MBBS or equivalent from a recognized university with at least six months experience each in General Medicine and General Surgery
d) MBBS or equivalent with MPH (one year duration). These candidates will be given exemption from first year but will have to attend the Community Eye Health Module

**OBJECTIVE OF MCEH PROGRAM**

To create a cadre of Ophthalmologists equipped & skilled in the following fields:

**Health Care Management:** understanding the concept of planning, situation analysis, strategy development, organizing, implementing and evaluating activities related to diseases of eye in community.

**Preventive And Eye Care Promoting Activities:** to be able to develop activities related to health education, preventive ophthalmology and act to improve the status of ophthalmic health of all ages of community.

**Epidemiology:** learning the concepts of principles of distribution and determinants of diseases in general and in ophthalmic medicine in particular.

**Ophthalmic Medicine Skills:** Updating knowledge, skills and practice of primary and secondary level ophthalmic care.
**Research:** Understand the need, process, literature search, conduct and publications in the field of preventive ophthalmology.

**Training Others:** Identify the training needs, curriculum development and conduct of courses for cadres supporting preventive ophthalmology.

**At the end of the course the doctors will be expected to:**

a) Play a leadership role in the field of community ophthalmology.

b) Design and perform programs aimed at prevention, promotion and care of ophthalmic diseases in the community.

c) Train support staff, develop teams aimed at conduct of research, projects, static and mobile services for ophthalmic condition of high risk groups of community.

**QUALIFICATION LEVEL**

Masters in Community Eye Health (MCEH) will be considered as equivalent to level 7 qualifications associated with the second cycle of qualifications in higher education in the framework adopted by the King Edward Medical University in line with similar framework developed by European Commission of Higher Education.

**EDUCATIONAL LEVEL**

a) Masters in Community Eye Health (MCEH) will be considered as equivalent to level M (Masters Level) qualifications in the framework described at paragraph (9) above & adopted by the King Edward Medical University.

b) Much of the study undertaken at this level will be at the forefront of an academic or professional discipline & students shall show originality in the application of knowledge understanding how boundaries of knowledge are advanced through research.

c) Students will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems.

**CAREER PROSPECTS**

The cadre will provide essential staff for primary, secondary & tertiary care units as community eye care specialists. They will have the opportunity to proceed to higher academic qualifications like FCPS, Ph.D. etc.

<table>
<thead>
<tr>
<th>Program Breakup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
</tr>
</tbody>
</table>

FIRST YEAR

(COMPREHENSIVE WRITTEN EXAMINATION THEORY)

There will be written examination by King Edward Medical University Lahore, after a student has passed in Semester I & II, in the following format:

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Paper</th>
<th>Subject</th>
<th>Maximum Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paper – I</td>
<td>Public Health Policy &amp; Management</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Paper – II</td>
<td>Public Health Practice</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Paper – III</td>
<td>Epidemiology &amp; Biostatistics</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Paper – IV</td>
<td>Community Ophthalmology</td>
<td>100</td>
</tr>
</tbody>
</table>

FINAL AWARD

Log Book                                               10%
Internal Assessment (Semester Evaluation)             40%
Comprehensive Examination                             50%

SECOND YEAR

PRACTICUM REPORT: PRACTICAL MANAGEMENT TRAINING ATTACHMENT

In order to provide the trainees an opportunity to get an insight into the working of district health system and hospitals a three month practical training attachment will be organized with prearrangements with the identified components of health system. Main emphasis will be on National Program for eye care, partner organizations e.g. WHO, Planning & Development departments, INGOs & NNGOs etc. It will also cover the district health system and hospital system.

Before the attachments there will be brief sessions on

- National Program for Prevention of Blindness
- District Health Systems & District Eye care systems
- District Health Government - new initiatives.
- Guidelines for District Health Attachments
At the end of practical attachment, students will present a report (having 100 marks), covering either one or all areas, as assigned by the course coordinator/ Course In charge. This will be an integral part of the log book during the second year.

**PROJECT WORK AND DISSERTATION ASSESSMENT (200 MARKS)**

In order to develop the skills of conducting a study based on scientific principles, students will be asked to identify a topic of Community Eye Health interest and conduct a small-scale study with some original data under the guidance of a supervisor from faculty. The topics of the dissertation will be submitted to the Board of Studies in Medicine, King Edward Medical University, for approval. On completion of the study, it will be presented in the form of a dissertation, which will be evaluated by a set of two examiners as given above. Thesis shall be a compulsory requirement for MCEH Degree.

**GENERAL VIVA VOCE EXAMINATION (200 MARKS):**

Covering all subjects + Dissertation

**FINAL OBTAINED MARKS WILL BE TRANSLATED INTO GRADES AND GRADE POINT**

**d) SUB SPECIALTY DEVELOPMENT PROGRAMS**

**i) FELLOWSHIP IN PEDIATRIC OPHTHALMOLOGY**

**INTRODUCTION**

The aim of paediatric ophthalmology fellowship program is to provide a comprehensive, structured training in this discipline at the end of which trainee will be able to handle cases of Pediatric ophthalmology and strabismus with confidence and competence. Like other disciplines of medicine, paediatric ophthalmologist need to work in close relation with other medical and non medical professionals like pediatricians, oncologist, public health workers and teachers etc. Children being national asset and saving, restoring their vision will go a long way to make them useful and productive member of society.

**RECRUITMENT CRITERIA**

1. The candidate should have a major diploma/degree in ophthalmology, like MS, FCPS, and FRCS.
2. At least two years of experience after above said post graduation.
3. The candidate should be motivated and ready to take the responsibility
4. Publications and research will be extra credit

**DURATION OF PROGRAM**

The duration of program will be two years, covering paediatric ophthalmology and strabismus.

1. It is aimed to develop the skills of the trainee in diagnosing various Paediatric Ophthalmology and vision development related problems in OPD.
2. Trainees will be involved in decision making and prioritizing the patients needing urgent surgical intervention in elective cases.
3. The fellows will be involved in the
   - admissions of pre-operative patients
   - History taking
   - Consent taking
   - Diagnosing the clinical pathology
   - Plan to proceed
4. In operation theatre the fellow with no previous experience in paediatric ophthalmology will assist cases with the supervising consultant for at least first six months. Second six months they will start operating with the supervising consultant as a first assistant

**CLINICAL SKILLS TO BE ATTAINED**

1. Approaching a child for examination
2. History taking
3. Vision assessment in preverbal children
4. Vision assessment in pre-literate children
5. Detection of strabismus and Amblyopia
6. Sensory tests for strabismus
7. Motor tests for strabismus
8. Vertical strabismus evaluation
9. Paralytic strabismus evaluation
10. Cycloplegic refraction technique
11. Assessment of low vision
12. Lachrymal function tests
13. Evaluation for glaucoma
14. Evaluation of lid and Ptosis
15. Biometry & Ocular Ultrasound
16. Radio-imaging
17. Evaluation of Proptosis
18. Electrophysiology
19. ROP screening

COMMUNITY OPHTHALMOLOGY AND RESEARCH
1. Epidemiology of childhood blindness
2. Applied statistics and research methodology
3. Community Ophthalmology
4. Project
5. Survey techniques for childhood blindness
6. Planning a childhood blindness control project
7. Setting up of a pediatric ophthalmology unit

PEDIATRIC SURGICAL SKILLS

EXAMINATION UNDER SEDATION

Application of YAG Laser (Minimum number of procedures 30)
Application of Argon Laser (Minimum number of procedures 20)
Application of Cryo (Minimum number of procedures 20)

AUDIT & LOG BOOK

- Each fellow will maintain his/her log book regarding the surgical as well as clinical procedures performed personally or under supervision.
- Each fellow will have to do an audit of all the surgical cases done by him personally and will be presented before the appraisal committee, once every six months.
RESEARCH & PAPER WRITING

- Every Fellow will be given one research project.
- The research project will have to be completed in two years time and final assessment will be made at the time of exit from the program.

ASSESSMENT / APPRAISAL

- Every fellow will have to appear before an appraisal committee once every six months.
- The appraisal committee will comprise of the supervising Consultant/consultants (internal) and member/members of paediatric ophthalmology faculty (external).
- During 6 monthly appraisal meeting each fellow will have to present up to date log book/Surgical Audit.
- A comprehensive assessment will be done on the basis of the performance of the trainee in the past six monthly periods, and areas of weakness will be pointed out and suggestions regarding the improvement will be put forward.
- At the end of each assessment goals or objectives will be set for the trainee to be met in the coming six month and those goals will be appraised in the next assessment meeting.
- At the end of two year program an exit assessment will be done which will include the last four six monthly assessments as well as the final assessment and trainee will defend his research project.
- Upon the satisfaction of the committee regarding the progression and attainment of the minimum required level of competence for a paediatric ophthalmologist, the exit from the program will be granted to the fellow and KEMU will be notified regarding the successful completion of the fellowship for that particular trainee.

ii) FELLOWSHIP IN VITREO RETINA

The aims of this VR fellowship are to provide comprehensive, supervised, structured and accredited training of postgraduate Ophthalmic Surgeons. The training will be provided in the specialty of both Surgical and medical Retina.

It is aimed that the trainees at the end of the fellowship program will be able to manage patients with posterior segment pathology with complete confidence and ability.

RECRUITMENT CRITERION

1. The applicant should be holding basic postgraduate diploma i.e. MS, FCPS, FRCS.

2. The applicant should have the aspiration to become fully trained VR surgeon.

3. Publications and research will be extra credit.

AIMS
1. It is aimed to develop the skills of the trainee in diagnosing various VR pathologies in OPD.

2. Trainees will be involved in decision making and prioritizing the patients needing urgent surgical intervention in selective cases e.g. RD with macula on or only eye situation or long standing detachment / long standing vitreous hemorrhage, Macular hole, etc.

STRUCTURE & DURATION

It is proposed to be a two year fellowship program.

Fellowship division;

1. Surgical Retina

2. Medical retina

THE FELLOWSHIP TRAINEES WILL BE INVOLVED IN THE

- Admissions of pre-operative VR patients
- History taking
- Diagnosing the clinical pathology
- Consent taking & Plan to proceed

SURGICAL RETINA (1ST YEAR)

In theatre the VR fellow with no previous VR experience will assist VR cases to the supervising consultant for at least first six months. In the second half of the six months they will start operating with the supervising consultant as a first assistant.

Number of cases to be assisted in first six months at least 50, before embarking on to start operating under supervision.

LASER PROCEDURES TO LEARN

- PRP, Focal, Macular Grid with Argon
- Direct / Indirect Laser Retionopexy
- Indirect PRP

Minimum Number of VR Surgical Procedures to be done by a fellow

- 1st year: 100
- 2nd year: 150

Minimum Number of Laser Procedures to be done by a fellow at the end of Fellowship

- Direct PRPs: 50
- Indirect PRPs: 50
• Direct Macular/ Focal Laser 50
• Direct / Indirect Laser Retinopexy 25

AUDIT & LOG BOOK

• Each fellow will maintain his/her log book regarding the surgical as well as laser procedures performed personally or under supervision.
• Each fellow will have to do an audit of all the surgical cases done by him personally and will be presented before the appraisal committee, once every six months.

RESEARCH & PAPER WRITING

• Every Fellow will be encouraged to take up at least one project every six months.
• It will be aimed that at least two clinical papers will be done by each fellow for the submission in international peer journal during the fellowship program.

ASSESSMENT / APPRAISAL

• Every fellow will have to appear before an appraisal committee once every six months.
• The appraisal committee will comprise of the supervising Consultant/ consultants (internal) and member/members of VR faculty (external).
• During 6 monthly appraisal meeting each fellow will have to present up to date log book / Surgical Audit.
• A comprehensive assessment will be done on the basis of the performance of the trainee in the past six months, and areas of weakness will be pointed out and suggestions regarding the improvement will be put forward.
• At the end of each assessment goals or objectives will be set for the trainee to be met in the coming six month and those goals will be appraised in the next assessment meeting.
• At the end of two year program an exit assessment will be done which will include the last four six monthly assessments as well as the final assessment.
• Upon the satisfaction of the committee regarding the progression and attainment of the minimum required level of competence for a VR surgeon, the exit from the program will be granted to the fellow and KEMU will be notified regarding the successful completion of the fellowship for that particular trainee.

e) M. Phil LEADING TO PhD PROGRAM IN VISION SCIENCES
i. Optometry
ii. Orthoptics
iii. Investigative Ophthalmic Technology

INTRODUCTION
College of Ophthalmology and Allied Vision Sciences (COAVS), King Edward Medical University/Mayo Hospital Lahore Pakistan is committed to train Human Resource in different disciplines of Ophthalmology to provide quality eye care services at all levels of Health Care, Primary, Secondary and Tertiary.

COAVS is running BSc Hons Vision Sciences program for Optometry, Orthoptics & Ophthalmic Technology (Investigative Oculist) since 2004. Competent and efficient Optometrist, Orthoptist & Investigative Oculist of international standard have been produced during the last 04 years and they all are working as member of ophthalmic teams at different levels of health care. The need has arisen to start research in different disciplines of Vision Sciences and produce research Scholars/Supervisors/Teachers in these fields as well. Considering the needs, COAVS has developed curricula for M Phil leading to PhD Program in Vision Sciences in the disciplines of Optometry, Orthoptics & Investigative Ophthalmic Technology. The programs developed are in line with the program being run at King Edward Medical University Lahore, Pakistan.

M.Phil VISION SCIENCE PROGRAM FACULTY

PROGRAM DIRECTOR
Professor Dr. Asad Aslam Khan (SI)

REGULAR FACULTY

• Prof. Dr. Asad Aslam Khan
• Prof. Dr. Tehseen Sahi
• Prof. Dr. Mumtaz Hassan
• Dr. Amtul Naseer
• Dr. Raza Ali Shah
• Dr. Ashal Pal
• Dr. Suhaile Sarwar
• Dr. Qasim Latif
• Dr. Junaid Afzal
• Dr. Nasir Ch
• Dr. Javed Ch
• Dr. M. Ramzan
VISITING FACULTY

- Faculty from Alder Hey Children Hospital, Liverpool UK
- Faculty from Vision 4 Children, UK
- Faculty from EyeLearn, UK
- Dr. M. Ajmal Ch, Nishtar Medical College, Multan
- Dr. Majid Hussain, Nishtar Medical College, Multan
- Dr. Khalid, Quaid e Azam Medical College, Bahawalpur
- Dr. Sarfraz, Punjab Medical College, Faisalabad

PROGRAM OUTLINE

The program of “M Phil leading to PhD” in subject of vision sciences (Optometry) has been developed in the light of frame work (rules & regulations) approved by the syndicate of KEMU and notified as version II, 2011.

DURATION OF THE PROGRAM: Five Years (Full Time)

ENTRY QUALIFICATIONS:
- BSc (Hons) Vision Sciences or Equivalent Qualification with minimum 16 Years of Education

ENTRY PROCEDURE:
- GRE Type OR Subject Test (MCQ Based) Written Test. Interview at Department of the Program Level

SCHEME OF THE PROGRAM

ENTRY TEST

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Semester – I</th>
<th>Taught courses + Evaluation (20 Weeks )30 CRH</th>
<th>Semester – II</th>
<th>Taught courses + Evaluation (20 Weeks) 30 CRH</th>
<th>Comprehensive Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semester – III</td>
<td>Research Project (Synopsis within 6 month of Passing Comprehensive examination)</td>
<td>Semester – IV</td>
<td>Research Work</td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>Research Work</td>
<td></td>
<td>Year 3</td>
<td>Research Work</td>
<td></td>
</tr>
<tr>
<td>Year 4-5</td>
<td>Research Work</td>
<td>Thesis writing + Submission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defense of Thesis</td>
<td></td>
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</tbody>
</table>
ANNEX-1-a

Criteria for M Phil leading to Ph.D Degree, King Edward Medical University, Lahore

MBBS/BDS or equivalent in the relevant subject from a recognized university. Minimum 16 years of schooling/130 credit hours

University based Subject test; GAT/GRE/NTS

Course work of Two semesters of 18 weeks each 30 credit hours/semester EU-CATS/KEMU,

Year 1	Semester 1	Semester 2

CGPA≥3.0

CGPA≥2.5 CGPA<3.0

Second Attempt

CGPA<3.0

CGPA≥3.0 CGPA≥2.5 CGPA<3.0

Transfer to MPhil

CGPA >2.5

Comprehensive Examination after second semester and those students who will maintain GPA 3 will be allowed to continue Ph.D program

Additional coursework/Research/Lab. Techniques/training equivalent to 18 credit hours for experimental sciences; within one semesters followed by comprehensive examination

PhD Candidacy

Synopsis / Research proposal within six months of course work

Research work 3-5 years

Acceptance of 1 paper in HEC recognized journals

Thesis evaluation by two foreign experts

Open Defense of Dissertation

Oral examination by a 2 local External Examiner (PhD) in addition to supervisor

Award of the PhD Degree

Termination of program

Dropout from PhD
### YEAR – 1 SEMESTER – I

#### CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Duration</th>
<th>701</th>
<th>702</th>
<th>703</th>
<th>704</th>
<th>705</th>
<th>706</th>
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</thead>
<tbody>
<tr>
<td>2 weeks 3-CR</td>
<td>3 weeks 4.5-CR</td>
<td>2 weeks 3-CR</td>
<td>3 weeks 4.5-CR</td>
<td>5 weeks 7.5-CR</td>
<td>5 weeks 7.5-CR</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Title of Module</th>
<th>701</th>
<th>702</th>
<th>703</th>
<th>704</th>
<th>705</th>
<th>706</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Vision Sciences</td>
<td>701</td>
<td>Research Methods &amp; Biostatistics</td>
<td>Molecular Biology &amp; Genetics</td>
<td>Basic Science</td>
<td>General Pathology</td>
<td>Neurophysiology of Vision &amp; Neuro-Ophthalmology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module Coordinator</th>
<th>701</th>
<th>702</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Prof. Dr. Asad Aslam Khan</td>
<td>701</td>
<td>Prof Dr Mulazim Hussain Bukhari Dr Kanwal Saba</td>
<td>Prof. Fridoon</td>
<td>Anatomy, Physiology &amp; Pathology Department of K.E.M.U</td>
<td>Prof Dr Mulazim Hussain Bukhari</td>
<td>Dr Ashal Pal Faculty from Alder Hey Children Hospital, UK Vision 4 Children, UK Eyelearn, UK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of Learning</th>
<th>701</th>
<th>702</th>
<th>703</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COAVS</td>
<td>Patiala Block</td>
<td>Patiala Block</td>
<td>Department Lecture Room</td>
<td>Department Lecture Room</td>
<td>COAVS</td>
<td></td>
</tr>
</tbody>
</table>

#### WEEKLY SCHEDULE

**Total No of Hours in Semester**: 720

- **Theory Lectures Hours/Weeks**: 18
- **Laboratory Hours/Weeks**: 12
- **Seminars and Assignments/Weeks**: 06
- **Self Learning Hours/Weeks**: 04

**Total Hours/Week**: 40

**Theory**: 70%

**Practical**: 30%
SEMESTER – I

MODULE 701 02 Weeks 03 Credit Hours

INTRODUCTION TO VISION SCIENCE

COURSE DESCRIPTION AND LEARNING OBJECTIVES
In this subject students will build on concepts presented on Ocular Genetics, Ocular Biochemistry. It will also cover advanced studies in Visual Science, especially Visual Psychophysics, Visual Neurophysiology and Neuro-imaging, and aims to give a good understanding of current ideas about Visual Function and Visual Mechanisms, with some discussion of their connections to Clinical and/or Industrial Practice in Optometry. The module will describe some of the fundamental science at a fairly advanced level, along with clinical studies on Spatial Vision, Temporal Vision, Binocular Vision, Neuro-imaging Techniques and their application to Amblyopia, Human Peripheral Vision, the role of M and P Cells and how this relates to Clinical Studies on Glaucoma, and the role of attention in vision.

COURSE CONTENTS
- Signal detection theory & psychophysics
- Spatial vision & feature coding
- Temporal vision & motion perception
- Masking and suppression
- Binocular interactions
- Crowding and summation
- Neuroimaging techniques: essential theory & methodology
- Neuroimaging in human Amblyopia
- Human peripheral vision: role of M & P cells
- Role of attention in vision

CLINICAL ATTACHMENT
In concerned Departments and Rooms

SEMINARS
Will be conducted on related topics

SELF LEARNING
- Review of literature
- Group discussion
- Computer review
Students will consult the relevant sections of the following books

BOOKS RECOMMENDED
- Text Book of Visual Science and Clinical Optometry
  Edited by: Bikas Bhattacharyya
RESEARCH METHODS & BIOSTATISTICS

COURSE DESCRIPTION AND LEARNING OBJECTIVES

- To help participants to formulate ideas that can be tested in a scientific manner
- To give participants a basic understanding of epidemiological methods and biostatistics.
- To develop the critical faculties of participants for evaluation of their own and other people’s work.
- To give practical experience of development of study protocols and applications for research funding.
- To give practical experience of use of computers for word processing, database manipulation, use of spreadsheets, statistical analysis, preparation of slides and overheads, internet communication and video conferencing and report writing.

COURSE CONTENTS

1. RESEARCH METHODS

- Philosophy, language, types and structure of Research
- Conceptualizing research, problem formulation, research objectives
- Review of literature, sources of knowledge
- The Planning-Evaluation Cycle
- Sampling terminology, Probability sampling, Non-probability sampling, Bias and Error
- Time in Research, Types of Relationships
- Variables, Hypotheses, Types of Data
- Introduction to Design, Types of Designs
- Experimental Design
- Survey Research, Types of Surveys
- Qualitative research, Qualitative Data
- Introduction to Design, Types of Designs, Experimental Design
- Questionnaires

2. BIOSTATISTICS

- Data display and summary, mean and standard deviation
- Populations and samples
- Statements of probability and confidence intervals
- Differences between means: type I and type II errors and power
- Differences between percentages and paired alternatives
- The t tests and the chi-squared tests
- Correlation and regression
- Study design and choosing a statistical test
3. EPIDEMIOLOGY
   - What is epidemiology?
   - Quantifying disease in populations
   - Comparing disease rates
   - Measurement error and bias
   - Planning and conducting a survey
   - Ecological studies, Longitudinal studies, Case-control, cross sectional studies and experimental studies

4. TECHNICAL WRITING
   - Synopsis writing
   - Grant proposal writing
   - Research paper writing
   - Thesis outline
   - Thesis writing

MODULE 703 02 Weeks 03 Credit Points

MOLECULAR CELL BIOLOGY

COURSE DESCRIPTION AND LEARNING OBJECTIVES
   - This course is the second in the series of two courses designed to introduce both classical and contemporary topics in biology to the students.
   - This course is structured to entertain students irrespective of their major.
   - After taking this course students will be expected to have a basic understanding of the following fundamental concepts
     1. The role of cellular and molecular biology in medicine
     2. Immunology
     3. Molecular and cellular developmental biology (“miracle of life” formation of a complex organism from a single cell)
     4. Evolution with a molecular perspective (natural force and their effect in transformation of life)

COURSE CONTENTS
   1. Recombinant DNA and Biotechnology
   2. Molecular Biology and Medicine
   3. Natural Defenses against Disease
   4. Differential Gene Expression in Development
   5. Animal Development: From Genes to Organism
   6. Development and Evolutionary Change
   7. The History of Life on Earth
   8. The Mechanisms of Evolution
9. Species and Their Formation
10. Reconstructing and Using Phylogenies
11. Molecular and Genomic Evolution

BOOK RECOMMENDED
Life, ‘The Science of Biology’ by Craig Heller

MODULE 704 03 Weeks 4.5 Credit Hours

BASIC SCIENCE

COURSE DESCRIPTION AND LEARNING OBJECTIVES

- This is a multidisciplinary course that in two weeks gives students basic knowledge of the five pillars of basic medical sciences i.e. Anatomy Physiology Pathology Biochemistry And Course Pharmacology.
- Student taking this course will be able to understand

COURSE CONTENTS

ANATOMY

1. EMBRYOLOGY
   - Fertilization, Zygote, Morula, Blastula, Gastrula, Embryonic period Derivatives of germ layers
   - Brief account of Amnion, Chorion, Placenta
   - Outline of development of Heart and its Anomalies
   - Brief account of development of Urogenital, Digestive systems

2. HISTOLOGY
   - Cell
   - Tissue (Epithelial tissue, Muscular tissue, Connective tissue and Nervous tissue)
   - General plan of microscopic structure of CVS
   - Systems (Respiratory, Urogenital, Digestive systems)

3. GENERAL ANATOMY
   - Classification of bones, their blood supply and ossification
   - Classification of Joints Nerve Supply and Blood supply
   - Types and Nerve supply of Muscles
   - Definition of Neuron and Peripheral and Central nervous system
   - Surface marking of Heart, Lungs, Abdominal viscera

4. THORAX
   - Thoracic cage movements
   - Heart and its External and Internal features and Blood supply
   - Lungs, Pleura, Mediastinum (Name of contents)
5. **ABDOMEN**
- Disposition of Abdominal and Pelvic viscera
- Outline of Blood supply
- Nerve supply and Lymphatic drainage and Peritoneal relation of viscera

6. **HEAD & NECK**
- Bones, Foramina of skull
- Names of Cranial nerves, Brief outline of 5th & 7th Cranial nerves
- Dural venous sinuses, Blood supply and Nerve supply (brief account)
- Nose, Pharynx and Larynx. (Blood supply and Nerve supply)

**PHYSIOLOGY**
1. Functional organization of the human body and control of the internal environment
2. Extra cellular fluid
3. Homeostasis
4. Dehydration and Rehydration and K+ Homeostasis
5. Anemia, Polycythemia
6. Resistance of body to infection-the leukocytes, tissue macrophage system and inflammation
7. Immunity and allergy
8. Hemostasis and blood coagulation
9. Cardiovascular system properties of cardiac output, CCF test cardiac function & Hypertension
   - Normal ECG, Acid Base Balance, urine formation
10. Respiration Spirometry, Regulation Real Electrocardiogram.
11. Body fluids & kidneys; regulation of acid-base balance
12. Pulmonary blood flow
13. The nervous system and special senses
14. The gastrointestinal tract
15. Metabolism and temperature regulation
16. Endocrinology and reproduction
17. Sports Physiology
18. Ovarian and testicular function tests
19. Thyroid, Parathyroid, Adrenal, pancreas, endocrine hypothalamus

**PATHOLOGY**
and opportunistic. Parasites of medial importance and their lab. Diagnosis such as protozoa, tape worms and round worms

3. Etiology and pathogenesis of thrombosis, complications and diagnosis thrombosis, type, mechanisms of change of various emboli, infarction and its diagnosis.

4. Nomenclature etiology of tumors, benign and malignant tumor, route of spread of malignant Tumor, effects of tumors, oncogens, Tumor suppress genes, tumor markers, and their diagnostic significance, some prototype specific Tumor.


7. Rheumatic, ischemic and congenital Heart disease, Endocarditis. Atheroma-its etiology, lesions and complications.


11. Tumors of bones, inflammation of bones and giants, muscle dystrophy important skin lesions and their diagnosis, inflammations and tumors in oral cavity including teeth and jaws.

12. Tumors of C.N.S inflammations of meninges and their lab diagnosis demyelinating diseases.

13. Tumors of lymph nodes and leukemia, multiple myeloma- lesions and lab diagnosis.

**BIOCHEMISTRY**

1. Fluid & Electrolyte & Acid Base Balance in Human Body with select Clinical Scenarios.
   - Constitution of Extra & Intracellular Fluids.
   - Extracellular Fluid Compartments; Select Dehydration & Edema Development & Management.
   - Intracellular Fluid Compartments; Select Dehydration & Edema Development & Management.

2. Metabolic Cross Talk in Glycomics. Health & Disease Scenarios
   - Site, Pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & Clinical Complications in Glycolysis, Hexose Shunt Pathway, Glycogenesis & Glycogenolysis, Kreb’s Pathway & Glycuronic Acid Pathway.

3. Metabolic Cross Talk in Lipomics. Health & Disease Scenarios
   - Site, pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & clinical Complications in Fatty Acid Oxidation & Biosynthesis, Ketosis, Cholestrogenesis & Lipoproteins.

4. Metabolic Cross Talk in Proteomics. Health & Disease Scenarios
   - Site, pathway Dynamics, Key & Regulatory Enzymes, Nutritional & Endocrine Command, Outcome & clinical Complications in Urea Cycle, Protein Biosynthesis & Select Amino acid Metabolism with Genetic Disorders.
5. The Liver & Biliary System
- Liver Functions & Liver Function Tests, Biliary Stasis, Cholecystitis & Pancreatitis, Jaundice.

6. Nutrition & Endocrines Modalities
- Biosynthesis, Storage, Mechanism of Release, Transport, Binding to Receptor, Mode of Activity, Biochemical Functions & Abnormalities in Vitamin A, D, K, C & B Complex.
- Biosynthesis, Storage, Mechanism of Release, Transport, Binding to Receptor, Mode of Activity, Biochemical Functions & Abnormalities in Insulin, Glucagon, Thyroid Hormones, Parathymid Hormones, Calcitonin, Growth Hormone, Aldosterone, Cortisol & Catacholamines.

COURSE PHARMACOLOGY
- Basic principles: Drug receptors and pharmacodynamics, pharmacokinetics, drug biotransformation
- Autonomic drugs
- Cardiovascular drugs
- Renal drugs
- Drugs with action on smooth muscles
- Drugs that act in the central nervous system
- Drugs used to treat diseases of blood, inflammation and gout
- Endocrine drugs
- Chemotherapeutic drugs
- Special aspects of perinatal, pediatric and geriatric pharmacology
- Drugs used in gastrointestinal diseases
- Therapeutic and toxic potential of over the counter drugs. Local acting Drugs.

MODULE 705 05 Weeks 7.5 Credit Hours

GENERAL PATHOLOGY

COURSE DESCRIPTION AND LEARNING OBJECTIVES
- Describe the responses to different types of injury at the cellular and sub cellular level
- Enlist the differences between necrosis and apoptosis
- Describe different morphological patterns of tissue necrosis
- Describe the different types of responses of the cells to stress
- Describe the different types of exogenous and endogenous pigmentations
• Describe the sequence of vascular changes in acute inflammation (vasodilatation, increased permeability) and their purpose
• Define the terms edema, transudate, and exudate
• Describe the steps involved in phagocytosis and the role of IgG and C3b as opsonins and receptors
• Compare and contrast acute versus chronic inflammation with respect to causes, nature of the inflammatory response, and tissue changes. Describe the differences between the various cell types (i.e. labile, stable, and permanent cells) in terms of their regeneration potential. List examples of each cell type
• Distinguish between fibrinous, purulent, and serous inflammation. Define an abscess
• Describe the systemic manifestations of inflammation and their general physiology, including fever, leukocyte left shift, and acute phase reactants
• Define and understand the process of excessive growth of different types of cell
• Differentiate the non-neoplastic excessive and neoplastic growths
• Understand the differences between benign and malignant tumors
• Understand the classification of different tumors
• Understand the TNM classification of malignant tumors
• Define and describe hyperemia and congestion, edema, hemorrhage, thrombosis, infarction and embolism
• Describe shock, its different types and understand mechanisms leading to shock.
• Describe the organization of nuclear material, its replication and division
• Understand different modes of inheritance
• Describe the different types of genetic aberrations
• Understand the basis of molecular diagnosis of genetic disorders
• Define the components of the immune system
• Understand the innate and adaptive immunity, the classes of immunoglobulins
• Define humoral and cellular immunity
• Define the differences between immunity and hypersensitivity
• Describe the autoimmune diseases and their diagnosis
• Understand the immune deficiency states

COURSE CONTENTS

1. CELLULAR BASIS OF DISEASE (Cellular responses to stress; Adaptations of growth and differentiation, Cell injury and cell death)
   • Hyperplasia
   • Hypertrophy
   • Atrophy
   • Metaplasia
• Causes of Cell injury
• Mechanisms of cell injury
• Reversible and irreversible cell injury
• Morphology of cell injury and necrosis
• Apoptosis
• Sub cellular responses to injury
• Intracellular accumulations
• Pathological calcification

2. INFLAMMATION AND HEALING
   • Acute Inflammation
   • Chemical mediators of inflammation
   • Outcomes of acute inflammation
   • Morphologic patterns of acute inflammation
   • Systemic effects of inflammation
   • Mechanisms of tissue regeneration
   • Repair by healing, scar formation and fibrosis

3. HEMODYNAMIC DISTURBANCES
   • Edema
   • Hyperemia and congestion
   • Hemorrhage
   • Hemostasis and thrombosis
   • Embolism
   • Infarction
   • Shock

4. NEOPLASIA
   • Biology of tumor growth
   • Benign and Malignant Neoplasms
   • Molecular basis of cancer
   • Host defenses against tumors
   • Clinical features of tumors

5. GENETIC DISORDERS
   • Mutations
   • Mendelian disorders
   • Disorders with multifactorial inheritance
   • Cytogenetic disorders
   • Single Gene disorders
   • Molecular diagnosis
• Diagnosis of Genetic diseases

6. **DISEASES OF IMMUNITY**
• General features of immune system
• Cells and tissues of the immune system
• Innate and adaptive immunity
• Disorders of the immune system
• Autoimmune diseases
• Immunological deficiency syndromes

**BOOK RECOMMENDED**
Robbins Basic Pathology Updated Edition: With STUDENT CONSULT Online Access by Vinay Kumar, Ramzi S. Cotran, and Stanley L. Robbins

**MODULE 706  05 Weeks  7.5 Credit Hours**

**NEUROPHYSIOLOGY OF VISION & NEUROPHTHALMOLOGY**

**COURSE CONTENTS**

♦ **NEUROPHYSIOLOGY OF VISION**
An advanced course which examines photoreceptor function, the retina, the neural processing of form and color by the geniculo-striate system, the neural control of eye movements and accommodation by midbrain and brainstem structures, the vestibular system as it relates to vision, eye-hand co-ordination, the neural processing involved in reading

**CLINICAL ATTACHMENT**
In concerned Departments and Rooms

**SEMINARS**
Will be conducted on related topics

**SELF LEARNING**
- Review of literature
- Group discussion
- Computer review

Students will consult the relevant sections of the following books

**BOOKS RECOMMENDED**
• Text Book of Visual Science and Clinical Optometry
  Edited by: Bikas Bhattacharyya
### OPTOMETRY

#### Class Schedule

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<td>Management of ocular pathologies</td>
<td>Optometry Branches - Neuro-developmental and Behavioral Optometry - Geriatric Optometry - Paediatric Optometry</td>
<td>Advance Contact lenses</td>
<td>Refractive Surgery</td>
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<td><strong>Module Coordinator</strong></td>
<td>Dr Imran Ahmed</td>
<td>Prof. Khalil Rana + Alder Hey Children Hospital, UK Vision 4 Children, UK Exl. Learn. UK</td>
<td>Prof. Dr Asad Aslam Khan + Dr. Ashal Pal + Alder Hey Children Hospital, UK Vision 4 Children, UK</td>
<td>Dr Qasim Latif</td>
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Total No of hours in semester: 720

Theory Lectures hours/weeks: 18

Laboratory hours/weeks: 12

Seminars and Assignments/weeks: 06

Self learning hours/weeks: 04

**Total Hours/Week**: 40

**Theory**: 30%
Practical 70%

MODULE 707 03 Weeks 02 Credit Hours

EPIDEMIOLOGY OF VISION ANOMALIES & OPTICAL CHARACTERISTICS OF EYE

COURSE DESCRIPTION AND LEARNING OBJECTIVES

- Student must have theoretical knowledge of distribution and frequency of visual problems.
- Student must be able to identify the burden of visual pathologies in region and across the globe
- Student must understand the role of accommodation in visual system
- Students must have detail knowledge of optical characteristics of eye

COURSE CONTENTS

a. Epidemiology Of Visual Anomalies
   The distribution, determinants and frequency of vision problems. Estimation of risk factors and the development of vision problems.

b. Accommodation And Convergence
   Mechanism of accommodation; stimulus to accommodation; time and amplitude characteristics of the response; synkinesis of accommodation and convergence; ACA ratio; the zone of clear single binocular vision

c. Optical Characteristics Of The Eye
   The refractive state of the eye and its variables; transmittance, absorption, scattering by the ocular media; pupil size, aberrations, diffraction limitations, resolution, and contrast transfer functions.

CLINICAL ATTACHMENT

In concerned Departments and Rooms

SEMINARS

Will be conducted on related topics

SELF LEARNING

- Review of literature
- Group discussion
- Computer review

Students will consult the relevant sections of the following books

BOOKS RECOMMENDED

Optometry Science, Techniques and Clinical Management
Mark Rosenfield, Nicola Logan, 2nd edition
ADVANCE OPTOMETRIC MANAGEMENT OF OCULAR PATHOLOGIES

COURSE DESCRIPTION AND LEARNING OBJECTIVES

At the end of this module students should be able to describe the types of glaucoma; other retinal diseases understand their management and be able to select the appropriate diagnostic tests to efficiently diagnose glaucoma and other retinal pathologies whilst understanding their limitations. The level of understanding achieved by candidates should enable them to take an active part in referral refinement schemes between Optometrists and Ophthalmologists. In some instances, education beyond current optometric practice is introduced in an effort to prepare the candidates for advanced clinical Challenges that this group of disorders might show.

COURSE CONTENTS

GLAUCOMA

This module covers best practice for Glaucoma detection, investigation and monitoring methodologies used in Optometry and the Ophthalmology service. While discussing all the Treatment options, emphasis is placed upon the advanced optometric management of this group of disorders. Differential diagnosis of optic disc cupping will also be discussed. Principles of screening for Glaucoma will be covered and their significance discussed in terms of standard diagnostic techniques: Perimetry, Intraocular Pressure measurement and optic nerve head appearance. The limitations of these techniques will be discussed in the context of new emerging technologies for the detection of Glaucoma.

Areas covered will include:

- Primary Glaucoma: Definition, diagnosis, risk factors, IOP measurement and fluctuations, optic disc examination, other examination techniques, POAG: risk factors, mechanism, POAG suspect, evaluation of potential Glaucoma, NTG: characteristics, confirmation, differential diagnosis, PACG: definition, risk factors, classification, manifestation, differential diagnosis, primary congenital Glaucoma
- Secondary Glaucoma: OAG: definition, risk factors, CAG: definition, risk factors, Pigmentary Glaucoma (clinical features), PEX glaucoma (clinical features), inflammatory glaucoma (clinical features), Neovascular Glaucoma (clinical features), post-traumatic glaucoma, lens induced glaucoma, glaucoma associated with eye surgery, Glaucoma associated with drug use, secondary congenital glaucoma
- Glaucomatous versus non-glaucomatous optic disc cupping: differential diagnosis and optometric considerations
- Glaucomas, management: POAG: factors to consider, aim, when to treat, target IOP, the Glaucoma suspect, targets, treatment options (medication, laser, surgery), systemic management; PACG: immediate intervention, follow-up; secondary Glaucoma: management, prevention
The principles of screening methodologies for the detection of glaucoma. How the effectiveness of diagnostic tests are evaluated in terms of sensitivity, specificity and predictive power.

Theoretical principles of perimetry in relation to selection of the optimal testing strategy for the detection and monitoring of glaucoma.

Statistical analysis of single and serial visual field data with respect to glaucoma diagnosis and monitoring.

Measurement of intraocular pressure and its role in diagnosis and management of glaucoma. The assumptions and limitations of measurement techniques will be covered in conjunction with the relationship of intraocular pressure to corneal thickness.

Anatomical features of the anterior segment will be evaluated in terms of their clinical assessment in relation to glaucoma; specifically slit lamp bio-microscopic examination and gonioscopy.

New technologies for the detection and monitoring of glaucoma. The limitations of standard visual field assessment will be related to novel measures of the visual field using frequency doubling technology, pulsar perimetry, flicker perimetry and short-wavelength sensitive perimetry. The emergence of imaging technologies for evaluating the structure of the optic nerve head and retinal nerve fiber layer will evaluated in terms of glaucoma diagnosis and monitoring.

RETINAL AND MACULAR DISORDERS
The module will cover the pathophysiology, detection, assessment and management of patients with disorders of the macula and retina. Ophthalmologic treatments will be examined, as well as the role of the optometrist in the screening and management of these conditions. New technologies for detection and treatment will be described, and there will be discussion of how these technologies might fit into optometric practice. The coursework assignment will involve the student building up a series of case reports linking theory to practice.

Areas covered will include:

- Retina and macula: structure and function
- Retinal detachment and vitreous disorders
- Retinal vessels: structure and functions
- Retinal venous and arterial disease
- Diabetic retinopathy and screening for diabetic retinopathy
- Age related macular degeneration
- Retina and macular dystrophies
- Systemic disorders and the retina
- Imaging techniques in retinal and macular disorders
- Basis of treatments for retinal disease.

CLINICAL ATTACHMENT
In concerned Departments and Rooms
SEMINARS
Will be conducted on related topics

SELF LEARNING
- Review of literature
- Group discussion
- Computer review

Students will consult the relevant sections of the following books

BOOKS RECOMMENDED
- Text Book of Visual Science and Clinical Optometry, Edited by: Bikas Bhattacharyya
- Clinical Ophthalmology, Writer: Jaack J Kanski Sixth Edition
- Clinical Guide to Glaucoma Management
  Eve J. Higginbotham and David A. Lee

MODULE 709 06 Weeks 04 Credit Hours
BRANCHES OF OPTOMETRY

COURSE DESCRIPTION AND LEARNING OBJECTIVES
- This course is designed to have theoretical knowledge and practical experience of different specializations of Optometry
- After the completion of this course the students will acquire knowledge of the these specialties in detail

COURSE CONTENTS

Neuro-Developmental Optometry
Module will provide optometrists with the opportunity for education and training in the field of neurodevelopmental optometry and its application in areas such as:
- learning difficulties
- traumatic brain injury
- sports vision
- binocular vision dysfunction

Geriatric Optometry

Population Base Optometric Practice for an Aging Patient

Understanding Older Patients
- Implications of demographic trends
- Aging and the life cycle continuum
- Ageism – myths, stereotypes, and realities about older persons

Meeting The Needs Of Older Patients
- Psychological and social aspects of aging
- Age-related differences in cognitive abilities
• Implications for staff role
• Implications for office design

Factors That Influence the Examination and Management of the Older Patient
• Multiple health problems
• Communication problems
• Polypharmacy – compliance issues
• Interaction of psychological, social, and physical factors
• Clinical evaluation – methods and techniques
• Interdisciplinary team care
• Institutional and home-bound patient care

Ocular Aging
• Expected Age-Related Ocular Changes
• Changes in the Adnexa
• Changes in extra-ocular muscles
• Media changes and effects
• Retinal aging and functional effects
• Central nervous system effects

CLINICAL ASSESSMENT AND MANAGEMENT
• Goals of Geriatric Patient Care: Quality of Life
• Prevention
• Maintenance
• Rehabilitation
• Enhancement
• Modification of Clinical Procedures
• Optometric and functional case history
• Assessing visual acuities
• Refracting and prescribing
• Evaluating ocular health
• Assessing visual fields
• Evaluating binocularity
• Implications for special tests
• Indications for color, contrast, and glare testing

PEDIATRIC OPTOMETRY
• Refraction of infant
• Special techniques for infant examination (OKN, Forced preferential looking, Hirschberg and Krimsky, Cycloplegic)
• Prescribing for the infant, other recommendations
• Amblyopia prevention
• Contact lens fitting

**CLINICAL ATTACHMENT:** In concerned Departments and Rooms

**SEMINARS:** Will be conducted on related topics

**SELF LEARNING**
♦ Review of literature
♦ Group discussion
♦ Computer review

**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books

*Optometry Science, Techniques and Clinical Management* Mark Rosenfield, Nicola Logan, 2nd edition

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**MODULE 710**  
04 Weeks  
06 Credit Hours

**ADVANCED CONTACT LENSES**

**COURSE DESCRIPTION AND LEARNING OBJECTIVES**
The module will cover the detection, assessment and management of patients requiring specialist contact lens fitting. Different approaches to management of patients will be examined, along with how they might be implemented in practice. The most common conditions requiring advanced contact lens practice will be discussed, including methods that help to differently diagnose common and unusual problems. Advice on avoiding severe complications will be included. Students will apply these skills to patients in practice, and we will consider how to retain contact lens patients and reduce dropout rates with appropriate management.

**COURSE CONTENTS**
• Contact lens complications and their management
• Corneal physiology in contact lens wear
• Managing dry eye in practice
• Biocompatibility in contact lens wear
• Avoiding contact lens dropouts and building your practice
• Contact lenses for the presbyopic patient
• Contact lenses for the astigmatic patient
• Contact lens use in swimming and sports
• Orthokeratology
• Fitting bespoke contact lenses

**CLINICAL ATTACHMENT:** In concerned Departments and Rooms

**SEMINARS:** Will be conducted on related topics

**SELF LEARNING**
BOOKS RECOMMENDED

Students will consult the relevant sections of the following books:

- Clinical Contact Lens Practice, Editors Edward S. Bennett and Barry A. Weissman

MODULE 711 04 Weeks 06 Credit Hours

ADVANCE LOW VISION PRACTICE

COURSE DESCRIPTION AND LEARNING OBJECTIVES

The module will cover the detection, assessment and holistic management of patients with visual impairment. The published evidence for different approaches to low vision rehabilitation will be examined along with how they might be implemented in practice. The most common conditions causing low vision will be discussed, concentrating on how and what information should be communicated to patients and their care takers. The assignment will allow candidates to apply theory to practice or to investigate the evidence basis for a chosen aspect of visual impairment.

COURSE CONTENTS

Low vision - definitions and epidemiology

- Signs, symptoms, visual effects, progression and management of the key conditions causing low vision part 1
- Signs, symptoms, visual effects, progression and management of the key conditions causing low vision part 2
- Visual assessment
- The patient's perspective - the psychology of visual loss
- Effective prescribing of optical and non-optical aids
- Electronic vision enhancement systems
- Assessment and management of children and people of a working age with visual impairment - including educational and working environment considerations, available resources, and charitable and government assistance
- The role of multi-disciplinary professionals in low vision - aids, lighting, eccentric viewing and mobility training
- Evaluation of outcomes and what should a comprehensive low vision service provide

CLINICAL ATTACHMENT: In concerned Departments and Rooms
REFRACTIVE SURGERY

COURSE DESCRIPTION AND LEARNING OBJECTIVES
The module will cover the selection, assessment and management of patients choosing refractive surgery. The different approaches to management of patients will be examined along with how they might be implemented in practice. The most common refractive surgery techniques will be detailed. Different surgery for Presbyopia will be included. The instrumentation that is used in the field of Refractive surgery will be explained.

COURSE CONTENTS
You will cover:
- Medico-legal issues and Council for Healthcare Regulatory Excellence (CHRE)
- Patient selection for refractive surgery
- Corneal topography and wave front technology
- Patient counseling, marketing and staff training
- Instrumentation used in refractive surgery assessment
- History of refractive surgery techniques
- Laser refractive surgery
- Intraocular lenses
- Surgery for Presbyopia
- Common complications and their management

CLINICAL ATTACHMENT: In concerned Departments and Rooms

SEMINARS: Will be conducted on related topics

SELF LEARNING
- Review of literature
- Group discussion
- Computer review
Students will consult the relevant sections of the following books

**BOOKS RECOMMENDED**

Mastering the Techniques of Lasik, Epilasik & Lasek (Technique & Technology)

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**ORTHOPTICS**

**CLASS SCHEDULE**

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<td>Title of Module</td>
<td>Fundamentals of vision science: Afferent &amp; Efferent Pathways</td>
<td>Clinical Foundation of Orthoptics &amp; Advance Ophthalmic Medical Technology</td>
<td>Concomitant &amp; Inconcomitant strabismus &amp; Other Disorders (Amblyopia, Strabismus Syndromes)</td>
<td>Neuronal Control of Eye Movements (Saccades, smooth pursuits)</td>
<td>Eye movement disorders &amp; its Management</td>
<td>Management of Disorders (Optical/Prismatic/Orthoptics/Pharmacology) in motility treatment</td>
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<tr>
<td>Module Coordinator</td>
<td>Dr. Ashal Pal, Alder Hey Children Hospital, UK, Vision 4 Children, UK, EyeLearn, UK</td>
<td>Dr. A. Majid, Alder Hey Children Hospital, UK, Vision 4 Children, UK, EyeLearn, UK</td>
<td>Dr. Sarfraz, Alder Hey Children Hospital, UK, Vision 4 Children, UK, EyeLearn, UK</td>
<td>Dr. Amtul, Alder Hey Children Hospital, UK, Vision 4 Children, UK, EyeLearn, UK</td>
<td>Dr. Ajmal Ch, Alder Hey Children Hospital, UK, Vision 4 Children, UK, EyeLearn, UK</td>
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**Total No of Hours in Semester 720**

- Theory Lectures hours/weeks: 18
- Laboratory hours/weeks: 12
- Seminars and Assignments/weeks: 06
- Self learning hours/weeks: 04

**Total hours/Week**: 40

- Theory: 70%
- Practical: 30%

**MODULE 707**

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**FUNDAMENTALS OF VISION SCIENCES**

**AFFERENT & EFFERENT PATHWAYS**

**COURSE DESCRIPTION AND LEARNING OBJECTIVES**
Afferent Pathways
This class is designed to acquaint the student with the anatomy/physiology of the human central nervous system as it relates to the sensation of vision. Testing parameters used in the afferent visual system examination will be discussed. Recent developments in perimetry, clinical psychophysics, and electrophysiology will be explored.

Prerequisites
This class is a prerequisite to Extra ocular Motility disorders, Ocular Manifestations of Systemic Disease, and is normally taken prior to, or concurrent with, Clinical Foundations of Ophthalmic Medical Technology

Efferent Pathways
Description
This class is designed to provide the student with knowledge of eye movements and the neurological control of ocular motility through lecture, discussion, and assigned readings, the student will analyze and determine how abnormalities of ocular motility can be indicators of a disease process and its area of localization.

LAB WORK: Clinical Attachment
SEMINARS: On Related Topics
SELF LEARNING
♦ Review of literature
♦ Group discussion
♦ Computer review

BOOKS RECOMMENDED: Students will consult the relevant sections of the following books;
- Clinical pathways in neuro-ophthalmology: an evidence-based approach
  By Andrew G. Lee, Paul W. Brazis

MODULE 708 03 Weeks 4.5 Credit Hours
CLINICAL FOUNDATION OF ORTHOPTICS & ADVANCE OPHTHALMIC MEDICAL TECHNOLOGY
COURSE DESCRIPTION AND LEARNING OBJECTIVES
CLINICAL FOUNDATIONS OF ORTHOPTICS
Description
This class will introduce the student to the wonders of binocular vision in its normal presentation and also the intricacies of its abnormalities. Integral to the class material will be the analysis of responses of the binocular system to various clinical challenges.
ADVANCED OPHTHALMIC MEDICAL TECHNOLOGY
Description
This course provides knowledge on advanced ophthalmic diagnostic techniques and preliminary data analysis used to detect ophthalmic disorders. It furthers a systematic approach to instrumentation selection and performance, and will equip students with the ability to recognize and solve inconsistencies in results occurring due to instrumentation, examiner or patient errors.

LAB WORK: Clinical Attachment
SEMINARS: On Related Topics
SELF LEARNING
♦ Review of literature
♦ Group discussion
♦ Computer review
BOOKS RECOMMENDED Students will consult the relevant sections of the following books
- Orthoptics: Handbook of Practical Skills
  Mari Gutter, Jesca van Petegem-Hellemans, Ingrid van Wijnen-Segeren, Hinke Marijke Jellema
- Borish's clinical refraction by William J. Benjamin, Irvin M. Borish

MODULE 709
04 Weeks
06 Credit Hours
CONCOMITANT & INCONCOMITANT STRABISMUS & OTHER DISORDERS
(Amblyopia, Strabismus Syndromes)
COURSE DESCRIPTION AND LEARNING OBJECTIVES
CONCOMITANT STRABISMUS: Description
In this subject students will build on concepts presented in Binocular Vision and Refraction. Students will develop an understanding of the theoretical concepts of aetiology, investigation, diagnosis and management of concomitant strabismus and its sensory anomalies. Using an enquiry-based learning program, students will integrate theoretical concepts with practical instrumentation and clinical techniques to apply optical, orthoptic, medical and surgical management for concomitant horizontal deviations, Amblyopia, micro strabismus and disorders of the vergence and accommodative systems in an evidence-based medical context. This subject will equip students to proceed to Incomitant Strabismus and Orthoptics Clinical Practice subjects.
CONCOMITANT STRABISMUS
Description
In this subject, students will build on concepts presented in Binocular Vision & Refraction, Concomitant Strabismus and Neuro-ophthalmology and Eye Movement Control. Students will develop an understanding of the aetiology, investigation, diagnosis, and management of incomitant strabismus and associated sensory consequences. Using an enquiry based learning program; students will integrate theoretical concepts with practical instrumentation and clinical techniques to apply optical, orthoptic,
medical and surgical management for various types of strabismus in an evidence based medical context with multidisciplinary provisions (incorporating ophthalmology, neurology, radiology and endocrinology). This subject will equip students to progress to the Orthoptics Clinical Practice subjects.

**LAB WORK:** Clinical Attachment

**SEMINARS:** On Related Topic

**SELF LEARNING**
- Review of literature
- Group discussion
- Computer review

**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books
- Pickwell's binocular vision anomalies: investigation and treatment, Volume 1 By Bruce J. W. Evans, David Pickwell
- Binocular Vision and Ocular Motility: Theory and Management of Strabismus, Authors: Gunter K. von Noorden, MD and Emilio C. Campos, MD
- Pediatric ophthalmology and strabismus By Kenneth Weston Wright, Peter H. Spiegel

**MODULE 710**

03 Weeks

4.5 Credit Hours

**NEURONAL CONTROL OF EYE MOVEMENTS**

(Saccades, smooth pursuits)

**Course Description and Learning Objectives**
- This course will enable students to understand the pathways for different eye Movements

**LAB WORK:** Clinical Attachment

**SEMINARS:** On Related Topics

**SELF LEARNING**
- Review of literature
- Group discussion
- Computer review

**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books
- The neurology of eye movements, R. John Leigh, David S. Zee
- Neuro-ophthalmology: neuronal control of eye movements By Andreas Straube, U. Büttner

**MODULE 711**

03 Weeks

4.5 Credit Hours

**EYE MOVEMENT DISORDERS & ITS MANAGEMENT**

**COURSE DESCRIPTION AND LEARNING OBJECTIVES:**

**EYE MOVEMENT DISORDERS**
Description
Extra ocular motility disorders and their treatment form the foundation for the understanding of ocular misalignment. In this class, anomalies of eye movement will be analysed and the etiology will be reviewed. Emphasis, though, will be placed on the clinical presentation, formulation of diagnosis, and patient prognosis of anomalous extraocular motility.

TREATMENT OF VISUAL / EYE MOVEMENTS DISORDERS
Description
This class will examine and discuss the management of ocular motility anomalies. An overview of historical and current treatment modalities both surgical and non-surgical will be discussed. Emphasis will be given to the determination and application of appropriate plans in case scenarios.

LAB WORK: Clinical Attachment:
SEMINARS
   On Related Topics
SELF LEARNING
   ♦ Review of literature
   ♦ Group discussion
   ♦ Computer review
BOOKS RECOMMENDED Students will consult the relevant sections of the following books
Eye Movement Disorders by Agnes M. F. Wong
Diagnosis and management of ocular motility disorders By Alec M. Ansons, Helen Davies, Joyce Mein
Clinical strabismus management: principles and surgical techniques By Arthur L. Rosenbaum, Alvina Pauline Santiago

MODULE 712  04 WEEKS  06 CREDIT HOURS
MANAGEMENT OF DISORDERS
(Optical/ Prismatic/ Orthoptic/ Pharmacology) in Motility Treatment

COURSE DESCRIPTION AND LEARNING OBJECTIVES
   ▪ This course is designed to encompass the diagnostic and clinical aspects of blood transfusion.
   ▪ After the completion of this course are expected to have in-depth knowledge of red cell antigens and anti-bodies.
   ▪ The students will gain knowledge of all aspects of clinical blood transfusion including blood component therapy and prevention of blood transfusion transmissible diseases.
   ▪ They will acquire up to date skills involved in laboratory blood transfusion.

LAB WORK: Clinical Attachment
SEMINARS: On Related Topics
SELF LEARNING
BOOKS RECOMMENDED: Students will consult the relevant sections of the following books

- Pickwell’s binocular vision anomalies: investigation and treatment, Volume 1 By Bruce J. W. Evans, David Pickwell
- *Binocular Vision and Ocular Motility: Theory and Management of Strabismus*, Authors: Gunter K. von Noorden, MD and Emilio C. Campos, MD

### INVESTIGATIVE OPHTHALMIC TECHNOLOGY

#### CLASS SCHEDULE

<table>
<thead>
<tr>
<th>MODULE</th>
<th>YEAR-1</th>
<th>2ND SEMESTER</th>
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<tbody>
<tr>
<td></td>
<td>707</td>
<td>708</td>
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<tr>
<td>Duration</td>
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<td>4 Weeks</td>
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<td>Cr-6</td>
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<tr>
<td>Title of Module</td>
<td>Ophthalmic Examination &amp; Investigation</td>
<td>Echography of the eye and orbit Ant. and Post. Segment &amp; Biometry/ Optical Biometry</td>
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<tr>
<td>Module Coordinator</td>
<td>Prof. Dr. Asad Asham Khan</td>
<td>Prof. Muntaz Hassan</td>
</tr>
<tr>
<td></td>
<td>Dr. Suhail Sarwar</td>
<td>Dr. Nasir Ch</td>
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<tr>
<td></td>
<td>Dr. Raza Ali</td>
<td>Prof. Dr. Asad Asham Khan</td>
</tr>
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<td>Place of Learning</td>
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<td>Total No of hours in semester</td>
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<td>Theory Lectures hours/weeks</td>
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<tr>
<td>Laboratory hours/weeks</td>
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Seminars and Assignments/weeks 06
Self learning hours/weeks 04
Total hours/Week 40
Theory 70%
Practical 30%

MODULE 707 03 Weeks 4.5 credit hours

EXAMINATION AND INVESTIGATION
COURSE DESCRIPTION AND LEARNING OBJECTIVES
At the end of this module student must have theoretical knowledge of procedure and equipments used in examination and investigation.

COURSE CONTENTS
1. Anterior and posterior segment examination with:
   - UBM
   - OCT
   - Angiography
   - Slit lamp
   - 90D, 78D and 20D lenses
   - Indirect ophthalmoscope
2. Clinical Assessments and their managements

CLINICAL ATTACHMENT: In concerned Departments and Rooms

SEMINARS: Will be conducted on related topics

SELF LEARNING: By Practicing the Procedures

RECOMMENDED: Practical Demonstrations

MODULE 708 04 WEEKS 06 CREDIT HOURS

OPHTHALMIC ECHOGRAPHY OF EYE AND ORBIT
(Ant. & Post. Segment)

COURSE DESCRIPTION AND LEARNING OBJECTIVES
Students must know all the equipment and techniques used in biometry.
Must be able to perform independently and interpret the results

COURSE CONTENTS
1. Anatomy of eye in relation to Ultrasonography
2. Principle & examination technique

INTERPRETATION (Ant. & Post. Segment)
- Vitre retinal diseases
- Infections and inflammations
- Trauma/IOFB
- Post surgical findings
- Glaucoma/optic nerve disorders
- Congenital defects
- Choroidal detachment

**ORBITAL SCAN**
- Techniques
- Indications
- Orbital lesions

**EXTRA OCULAR MUSCLES**
- EOM techniques
- EOM disorders

**PEDIATRIC OPHTHALMIC ULTRASONOGRAPHY 3-D RECENT ADVANCEMENT IN USG**

**BIOMETRY/OPTICAL BIOMETRY**
Principle/ technique (manual, automatic)

IOL power calculation:
- Formulas
- After corneal refractive surgery
- In children
- After incisional and photo -ablated refractive surgery

**CLINICAL ATTACHMENT:** In concerned Departments and Rooms

**SEMINARS:** Will be conducted on related topics

**SELF LEARNING**
- Review of literature
- Group discussion
- Computer review

**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books

1. Ultrasound Clinics/Editor: Arun D Singh, Brandy C Hayden, Charles J.Pavlin
3. Clinical Ophthalmic Ecography/Editor: Rogar P.Harrye Md
4. Ultrasound of the Eye and Orbit/ Editor: Sandra Frazier Byrne, Ronald L.Green,
5. Mastering In IOL Power Techniques
6. Ultrasound of the Eye and Orbit/Editor: Sandra Frazier Byrne, Ronal L.Green

**MODULE 709**
03 WEEKS 4.5 CREDIT HOURS

**LASERS & ELECTROPHYSIOLOGICAL TESTS**
COURSE CONTENTS

1. Types and indications of lasers
2. Miscellaneous applications and Complications of lasers
3. Lasers for:
   - Retinal disorders
   - Glaucoma and anterior segment disorders
   - Cataract and refractive surgery
4. Electrophysiological Tests

CLINICAL ATTACHMENT: In concerned Departments and Rooms

SEMINARS: Will be conducted on related topics

SELF LEARNING

♦ Review of literature
♦ Group discussion
♦ Computer review

BOOKS RECOMMENDED: Students will consult the relevant sections of the following books

Lasers In Ophthalmology/ Editor:Japee (Latest Edition)

MODULE 710 03 WEEKS 4.5 CREDIT HOURS

CORNEA

COURSE DESCRIPTION CONTENTS AND LEARNING OBJECTIVES

CORNEA

1. Corneal topography
2. Corneal scanning
3. Specular microscopy
4. Corneal histology
5. Corneal banking
6. Orb-scan
7. Keratoscopy

OCT

1. Principle/Technique
2. Anterior segment Interpretation
3. Posterior segment interpretation

CLINICAL ATTACHMENT: In concerned Departments and Rooms

SEMINARS: Will be conducted on related topics

SELF LEARNING

♦ Review of literature
♦ Group discussion
♦ Computer review

**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books

2. Step By Step Oct/ Editor: Japee( Latest Edition)
3. Retinal Angiography And Oct / Editor: J.Fernando Arevalo

**MODULE 711**  
**04 WEEKS**  
**06 CREDIT HOURS**

**ANGIOGRAPHY/ OPHTHALMIC PHOTOGRAPHY AND SKETCHING**

**COURSE CONTENTS**

- Fluorescein Na
- Auto Fluorescein/ Pseudo
- Ant/Post photography
- Ret cam
- Anatomical ,physiological consideration
- Basis
- Dyes
- Adverse effects
- Limitations
- Normal angiogram and Abnormal fluorescence

**FFA IN SPECIFIC DISORDERS**

- Retinal vasculopathies
- Macular disorders
- Retinal vascular malformation and tumors
- Choroidal diseases
- Optic nerve disorders

**CONFOCAL SCANNING LASER OPHTHALMOSCOPY:**

1. Corneal module
2. Retinal module
3. Optic nerve module
4. Glaucoma
5. Pachymetry

**CLINICAL ATTACHMENT:** In concerned Departments and Rooms

**SEMINARS:** Will be conducted on related topics

**SELF LEARNING**

♦ Review of literature
♦ Group discussion
♦ Computer review
**BOOKS RECOMMENDED:** Students will consult the relevant sections of the following books

1. Understanding Of Fa/Editor: Manfred Spitnas
2. Using Fa To Assess Retinal Diseases/Editor: Bonnie M Gauer
3. Quantitative Three-Dimensionl Imaging Of Posterior Segment with HRT

**MODULE 712**

**03 WEEKS**

**4.5 CREDIT HOURS**

**PERIMETRY & REFRACTIVE SURGERY**

**COURSE CONTENTS:**

**PERIMETRY**

- Background/normal VF/fundamentals
- Functional visual anatomy
- Classification and interpretation and VF printout
  - VF loss in glaucoma
  - Neurological VF defects
  - Follow up examination
  - Overview printout
  - Change analysis printout
  - Glaucoma progression analysis
  - Types of perimetry

**REFRACTIVE SURGERY**

- Types / procedure
  - Lasik
  - Lasek
  - PRK
  - Common applications and complications and their management

**CLINICAL ATTACHMENT**

In concerned Departments and Rooms

**SEMINARS**

Will be conducted on related topics

**SELF LEARNING**

- Review of literature
- Group discussion
- Computer review

Students will consult the relevant sections of the following books

**BOOKS RECOMMENDED**
N. EXTRA-CURRICULAR ACTIVITIES CO-CURRICULAR

Apart from routine studies, the students of COAVS take active part in extracurricular activities arranged by their different clubs.

- Sports Club
- Literary Club
- Dramatic Club

O. DISCIPLINE

- Attendance, regularity & punctuality shall be strictly observed.
- No political sectarian ethnic or partisan activity of any sort will be allowed during the course.
- Any kind of weapons liquor or drugs of addiction are strictly prohibited.
- A disciplinary committee constituted by the director COAVS will decide any matter of ill discipline referred to it by any quadrant
- The decision of the Principal COAVS will be final & binding upon the students.

P. FEES

Tuition fee will be decided by the Health Department, Government of the Punjab.

The students will, however, pay the usual examination dues for example Registration Fee, Examination Fee according to Rules and Regulations of concerned examining authority/body.

Q. HOSTEL

- Hostel facility not available.
- Hostel may be arranged with the support of INGOs by acquiring houses/premises on rental basis. However the student will have to pay for the utility bills and food.
- In case, if rent is not supported by the INGOs then the student will have to share the rent as well

Note. No student shall leave the course prior to its completion due to any reason, otherwise they would be liable to deposit all the expenditures incurred on them.

R. CONTACT
S. UNDERTAKING BY STUDENT AND THE GUARDIAN

The college administration has the right to fine, suspend, rusticate, relegate or terminate the studentship of the student found guilty of;

1. Cheating stealing immoral conduct or misbehavior, smoking and using mobile inside building etc
2. Willfully and deliberately damaging or misusing the college property
3. Rudeness to members if teaching and administrative staff
4. Violating the rules and regulations of the college /or the instructions given to std from time to time
5. Being habitual irregular and unpunctual
6. Non possession of ID cards in the college vicinity
7. Showing consistently poor performance in study
8. Exciting or staging a walkout, strike, compelling other std not to attend the classes or an unauthorized possession
9. Use of drugs or carrying weapons/firearms
10. Providing fake documentary proof for academic certificate /medical certificate etc.
11. Providing wrong information in the application form at the time of admission
12. Inducing, pressurizing other students or indulging in politics

I ___________________________ S/D/O ____________________________ Hereby agree to the terms and conditions mentioned above for admission

Signature of candidate______________________                  CNIC No
Name of candidate______________________________
Signature of Guardian__________________________   CNIC No
Name of guardian______________________________
Date:

Signature of Judicial Magistrate/Civil Judge