



Rawalpindi Medical University

Curriculum

Diploma in Ophthalmic Medicine Surgery

2023

Preface

The horizons of Medical Education are widening & there has been a steady rise of global interest in Post Graduate Medical Education, an increased awareness of the necessity for experience in education skills for all healthcare professionals and the need for some formal recognition of postgraduate training in Ophthalmology.

We are seeing a rise in the uptake of places on postgraduate courses in medical education, more frequent issues of medical education journals and the further development of e-journals and other new online resources. There is therefore a need to provide active support in Post Graduate Medical Education for a larger, national group of colleagues in all specialties and at all stages of their personal professional development. If we were to formulate a statement of intent to explain the purpose of this log book, we might simply say that our aim is to help clinical colleagues to teach and to help students to learn in a better and advanced way. This book is a state-of-the-art log book with representation of all activities of the MS Ophthalmology program at RMU. A summary of the curriculum is incorporated in the logbook for convenience of supervisors and residents. MS curriculum is based on six Core Competencies of ACGME (Accreditation Council for Graduate Medical Education) including

Patient Care, Medical Knowledge, System Based Practice, Practice Based Learning, Professionalism, Interpersonal and Communication Skills. A perfect monitoring system of a training program including monitoring of teaching and learning strategies, assessment and Research Activities cannot be denied so we at RMU have incorporated evaluation by Quality Assurance Cell and its comments in the logbook in addition to evaluation by University Training Monitoring Cell (URTMC). Reflection of the supervisor in each and every section of the logbook has been made sure to ensure transparency in the training program. The mission of Rawalpindi Medical University is to improve the health of the communities and we serve through education, biomedical research and health care. As an integral part of this mission, importance of research culture and establishment of a comprehensive research structure and research curriculum for the residents has been formulated and a separate journal for research publications of residents is available.

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(MBBS, MCPS, FCPS, FACG,
FRCP (Lon), FRCP (Glasg), AGAF)

Vice Chancellor

Rawalpindi Medical University

Enrolment Details

Program of Admission _____

Session _____

Registration / Training Number _____

Name of Candidate _____

Father's Name _____

Date of Birth _____ / _____ / _____

CNIC No. _____

Present Address _____

Permanent Address _____

E-mail Address _____

Cell Phone _____

Date of Start of Training _____

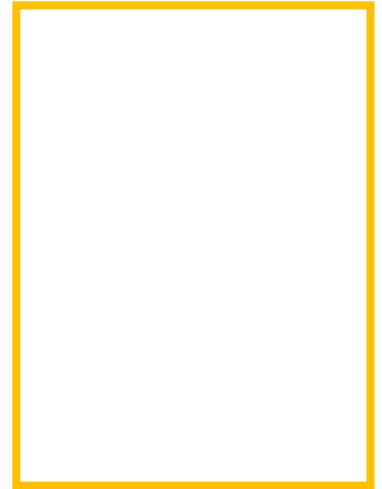
Date of Completion of Training _____

Name of Supervisor _____

Designation of Supervisor _____

Qualification of Supervisor _____

Title of department / Unit _____



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Aims and Objectives of the Course

Aim

The aim of 2 years diploma programme in Eye is to equip medical graduates with relevant professional knowledge, skills and ethical values to enable them to apply their acquired expertise at primary and secondary health care organizations as non-academic consultants.

Objectives

At the end of training in DOMS, a trainee doctor should be able to:

1. Take a comprehensive and pertinent history of a patient presenting with Eye related complaints
2. Perform detailed physical examination in a rational sequence that is both technically correct as well as methodical
3. Elicit physical signs without discomfort to the patient
4. Evaluate patients in the setting of outpatient department, hospital wards and emergency
5. Order a set of relevant investigations considering availability, diagnostic yield, cost-effectiveness, side effects, and implications for management
6. Comprehend Community Indicators related to individual's health
- 7 Apply national and international guidelines for treatment and assessment
8. Counsel patients and relatives in patient's preferred language in elective and emergency situations in keeping principles of good communication skills, empathy and empowerment of patients
9. Exhibit emotional maturity and stability, integrity, ethical values and professional approach and sense of responsibility in day-to-day professional activities
10. Take proper informed consent for physical examination and ensure confidentiality and appropriate environment for intimate physical examination
11. Act as an independent specialist at community/Tehsil and District Headquarter Hospital
12. Show initiative and become life-long self-directed learners tapping on resources including clinical material, faculty, and internet and on-line learning programs and library
13. Referral.

Specific Learning Outcomes

Following competencies will be expected from a student completing 2 years' course in DOMS, including clinical, surgical and preventive practice in eye, student should be able to:

1. Explain etiology, pathogenesis, epidemiology and management of disorders in Eye on topics given in the list of course contents
2. Explain principles of basic sciences as applied to Eye like hemorrhage, blood transfusion, shock, sterilization of instruments, infection, antibiotics, inflammation, repair & healing and malignancy
3. Identify common eye problems in a scientific manner while keeping in mind the logical reasoning and a clear understanding of their impact on human mind and body
4. Formulate a working diagnosis and consider relevant differential diagnosis
5. Decide and implement suitable treatments considering safety, cost factors, complications and side effects
6. Practice proper procedures in operating theatres & procedure rooms including gowning, gloving, use of various sutures, surgical principles, & use & working of electro medical equipment
7. Perform routine eye related procedures like cataract surgeries.
8. Maintain follow-up of patients at appropriate intervals, recognizing new developments and/or complications and offering sensible management protocols

Nomenclature and Duration

Nomenclature of the proposed course:

The name of diploma course should be retained as DOMS. This name has been recognized and established for the last many decades worldwide. The duration of courses should be two years structured training in a recognized department under an approved supervisor.

Course Title: DOMS (Diploma in Ophthalmic Medicine and Surgery)

Training Centers: Ophthalmology Department Rawalpindi Medical University and Allied Hospitals (Holy Family Hospital, Benazir Bhutto Hospital, District Head Quarter Hospital)

Course Duration and Scheme of the Course:

Total Duration 2 years structured training (12 months in **Part I** (Basic Ophthalmology and Optics) and 12 months in **Part II**) in a recognized department under the guidance of an approved supervisor

Part-IA (1st Year-Basic Ophthalmology)

Theoretical Component

- Anatomy of Orbit and its application pertaining to diseases and surgical procedures
- Physiology of eyeball and adnexa and structures as applied to or affected by disease process
- Pathology (Microbiology, Interpretation of Laboratory Test)
- Ocular Pharmacology
- Principles of General Surgery
- Behavioral Sciences
- Biostatistics and Research

Clinical Component

•Instrumental Skills

1. Slit Lamp Examination
2. Direct Ophthalmology
3. Indirect Examination
4. 90D Examination
5. Gonioscopy
6. Use of Microscope
7. Refraction
8. Ophthalmometry
9. Hess Test
10. Keratometry
11. Visual Field
12. Ultrasound

•Clinical Skills

1. Visual Acuity
2. Pupil Reactions
3. Digital Tonometry
4. Ocular Movements
5. Cover Test
6. Colour Vision
7. Lid Eversion
8. Regurgitation

•Regular duties in wards and OPD Routine history taking, examination and investigations.

Part-IB (1st Year-Optics and Refraction)

Theoretical Component

1. Light
2. Reflection
3. Laws
4. Plain surface
5. Lenses and Curved Surface
6. Total internal reflection
7. Principals of refraction
8. Prisms

Clinical Component

1. IOLs
2. Calculation
3. Retinoscopy
4. Objective & Subjective Refraction
5. Cross cylinder
6. Dechrome test
7. Transposition of lenses
8. Low vision aids

Part II (2nd year)

Theoretical Component

- Neuro-ophthalmology
- Medical Ophthalmology
- Differential Diagnosis
- Lids
- Cornea
- Conjunctiva
- Uveal Tract
- Lens
- Glaucoma
- Retinal Disease
- Lacrimal Apparatus
- Ocular Motility

Clinical Component

- Surgical Skills
 - Cataract Extraction
 - Glaucoma Surgery
- Common Lid Surgery
 - Ectropion
 - Entropion
 - Trichiasis
- Common Conjunctival Surgery
 - Pterygium
 - Squint
- Regular duties in ward and OPD
- Routine history taking examination and investigations

Radiological Tests

- X-ray
- CT
- MRI
- Ultra Sound
- A scan
- B scan

Eligibility Criteria for Admission

Documents Required for the Admission

1. Completed DOMS application form
2. Copy of MBBS degree with mark sheets of professional examinations and certificate of number of attempts in the professional examinations
3. Copy of Matric and F.SC Certificate.
4. Copy of PMC registration certificate
5. Three latest passport size photographs
6. Reference letters from two consultants, with whom the applicant has worked (Preferable).
7. Certificates of completion of required experience if any.

General Requirements

Candidates eligible for admission should have MBBS or equivalent qualification, registered with PMC and have One-year House Job experience.

Special Requirements

- A. Obtaining pass percentage in the entry test as determined by the RMU rules
- B. Qualifying the interview successfully
- C. Extra credentials as determined by the RMU rules (no. of attempts in each professional, any gold medals or distinctions, relevant work experience, research experience from a recognized institution, any research article published in a National or an International Journal)

Registration And Enrollment

- The total number of students enrolled for the course must not exceed 8 per unit
- RMU Rawalpindi will approve supervisors for diploma courses
- Candidates selected for the courses will be registered with relevant supervisors and enrolled at RMU

Recognition/Equivalence of the Degree and Institution

After two years training course, candidate should be given status of mid-level specialist equivalent to any other similar qualification.

Accreditation related issues of the institution:

1. Faculty

Properly qualified teaching staff in accordance with the requirements of PMC.

2. Adequate Space

Including class-rooms (with audiovisual aids), computer lab, examination rooms and relevant instruments and machines for eye examination for example, Ophthalmoscope direct and indirect, retinoscope, slit lamp bio-microscope, gonioscope and three mirror lens, tonometer, Cross cylinder, ultrasound machine, operation theater, Operating microscope, 90, 78, and 60 D lens, keratometry

3. Library

Departmental library should have latest editions of recommended books for DOMS, reference books and latest journals (two National and one International)

Content Outline

Part-IA (Basic Ophthalmology)

Anatomy

1. Applied Embryology of Eye
2. Orbit bones
3. Soft parts
4. Cranial nerves, autonomic nervous system
5. Eye ball + Adnexa
6. Pathways + Cortex
7. Extra ocular muscles
8. Eye ball with its coats
9. Cranial Nerves, 2nd, 3rd, 4th, 5th, 6th, 7th,
10. Autonomic supply of the orbit and its contents
11. Blood supply of the orbit and its contents
12. Lacrimal system
13. Visual pathway and visual cortex

Physiology

The candidate should be able to understand functions of the eye ball and adnexa and structures as applied to or affected by a disease process.

1. Transparency of Cornea
2. Aqueous humor dynamics
3. Pupil, its functions and controls
4. Accommodation
5. Functions of retinal pigment epithelial cells–retina and its physiology
6. Rods and cones, formation of nerve signal and vitamin A metabolism
7. Lens transparency
8. Functions of extra ocular muscles (ocular motility)
9. Binocular vision

Pathology

1) General Pathology

- a) Cell Injury and adaptation
- b) Inflammation
- c) Cell repair and wound healing
- d) Hemodynamic disorders
- e) Neoplasia
- f) Immunity and Hypersensitivity

2) Special Pathology

- 1) Tumors
 - a) Orbital tumors
 - b) Adnexal tumors
 - c) Ocular tumors
 - d) Metastatic tumors
 - e) Paraneoplastic syndromes
 - f) Masquerade syndromes

3) Microbiology

- 1) History and introduction to Microbiology
- 2) Microbiology, Physiology, Life Cycle and Classification and parasites.
- 3) Role of Microbes in Various Human Diseases
- 4) Infection source
- 5) A brief account of the classification of microorganisms.
- 6) Morphology: Identification of various shapes of bacteria and viruses under the microscope.

- 7) Distribution, size, motility, reproduction and functions of bacteria and viruses.
- 8) Effects of environment upon bacteria and viruses.
- 9) Sterilization and disinfection. Definition, use of physical and chemical disinfectants.
- 10) Infection and immunity pathogenicity, pathology of infection, resistance and natural immunity, antigens and antibodies.
- 11) Common Bacterial and viral diseases of man.
- 12) Spores, Yeast and molds.
- 13) Nosocomial Infections
- 14) Bacterial Growth and Death
- 15) Important Viruses
- 16) Important Parasites
- 17) Sterilization and disinfection
- 18) Immunization
- 19) Use of Investigation and Procedures In Laboratory
- 20) Interpretation of Laboratory Tests
- 21) The student should be able to understand the relevance and importance of Swab (Collection, Transfer and Plating) and Biopsy (Collection and Transfer)
- 22) Gram Staining
- 23) TLC, ESR and Hb%

Ocular Pharmacology

- 1) Cycloplegics & mydriatics
- 2) Antibiotics Antiviral Anti-fungal
- 3) Anti-glaucoma drugs
- 4) Anti-histamines
- 5) Topical anesthetics
- 6) Steroids
- 7) Non-steroidal anti-inflammatory drugs
- 8) Lubricants
- 9) Diagnostic Stains: Fluorescein, Rose Bengal

Behavioral Sciences

- 1) Bio-Psycho-Social (BPS) Model of Health Care
- 2) Use of Non-Medicinal Interventions in Clinical Practice
 - (a) Communication Skills
 - (b) Counselling
 - (c) Informational Skills
- 3) Crisis Intervention/Disaster Management
- 4) Conflict Resolution
- 5) Breaking Bad News

- 6) Medical Ethics, Professionalism and Doctor-Patient Relationship
 - (a) Hippocratic Oath
 - (b) Four Pillars of Medical Ethics (Autonomy, Beneficence, Non-maleficence and Justice)
 - (c) Informed Consent and Confidentiality
 - (d) Ethical Dilemmas in a Doctor's Life.
- 7) Delivery of Culturally Relevant Care and Cultural Sensitivity.
- 8) Psychological Aspects of Health and Disease
 - (a) •Psychological Aspect of Health
 - (b) •Psychological Aspect of Disease
 - (c) •Stress and its Management
 - (d) •Psychological Aspect of Pain
 - (e) •Psychological Aspect of Aging

Biostatistics and Research

- 1) Introduction to Bio-Statistics
- 2) Introduction to Bio-Medical Research
- 3) Why research is important?
- 4) What research to do?
 - (a) Selecting a Field for Research
 - (b) Drivers for Health Research
 - (c) Participation in National and International Research
 - (d) Participation in Pharmaceutical Company Research
 - (e) Where do research ideas come from
 - (f) Criteria for a good research topic
- 5) Ethics in Health Research
- 6) Writing a Scientific Paper
- 7) Making a Scientific Presentation
- 8) Searching the Literature

Part-IB (Optics and Refraction)

Physical Optics

- 1) Light
- 2) Lasers
- 3) Reflection
- 4) Laws
- 5) Plain surface
- 6) Lenses and their form best
- 7) Curved Surface
- 8) Total internal reflection
- 9) Principals of refraction

10) Prisms

Clinical Optics

- 1) OLs
- 2) Optics
- 3) Calculation
- 4) Principles of Refraction
- 5) Retinoscopy
- 6) Objective
- 7) Subjective
- 8) Cross cylinder
- 9) Duochrome test
- 10) Transposition of lenses
- 11) Low vision aids
- 12) Optics and ray diagrams of Instruments

Part II (Clinical Ophthalmology)

Neuro Ophthalmology

- (a) Disc Oedema
- (b) Optic Neuritis
- (c) Intra-cranial pathology affecting
 - i. •Eyes
 - ii. •Vision
 - iii. •Visual Field
- (d) Paralytic squint

Medical Ophthalmology

- (a) Autoimmune disease and eyes
- (b) Intraocular tumors
- (c) Endocranial Disease

Lids

- (a) Entropic/Ectopia
- (b) Blepharitis
- (c) Tumors
 - i. -Benign
 - ii. -Malignant
- (d) Ptosis

Cornea

- (a) Keratitis
- (b) Bacterial
- (c) Viral
- (d) Chlamydial
- (e) Fungal
- (f) Corneal Opacities
- (g) Corneal degeneration and dystrophia
- (h) Keratoconus

Conjunctiva

- a. Inflammation
- b. Pterygium
- c. Tumors
 - i. -Benign
 - ii. -Malignant
- d. Symblepharon
- e. Dry Eye

Uveal Tract

- a. Uveitis
 - i. Type
 - ii. Complication
 - iii. Treatment
- b. Coloboma

Lens

- a. Types of Cataracts
- b. Syndromes
- c. Surgery

Glaucoma

- a. Types of Glaucoma
- b. Treatment
 - i. Medical
 - ii. Betablockers
 - iii. Prostaglandins
- c. Others
 - i. Surgical

Retinal Disease

- a. Diabetic retinopathy
- b. Retinal detachment
- c. Central retinal vein occlusion and artery occlusion
- d. Vitreous hemorrhage

Lacrimal Apparatus

- a. Lacrimal passages obstruction and management at different ages
- b. Dry eye

Ocular Motility

Squint

-Paralytic

-Myasthenia Gravis

Differential Diagnosis

Students should know major groups of differential diagnosis

Low Vision

-Painless gradual

-Painless sudden

-Painful sudden

-Painful gradual

Red Eye

Painful blind eye

Diplopia

Proptosis

Cause of periorbital edema

early constriction of visual field

Congenital and developmental diseases of the crystalline lens

Epiphora/watery eye

Corneal deposits/opacities

White pupil

Dry eye

Ocular surface disease

Papillae

Follicles

Methods of Instruction/Course Conduction

As a policy, active participation of students at all levels will be encouraged.

Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinic-pathological conferences
6. SEQ as assignments on the content area
7. Self-study, assignments and use of internet
8. Bedside teaching rounds in ward
9. OPD & Follow-up clinics
10. Operation/assistance/supervised surgery
11. Long and short case presentations
12. Clinical skills training workshops

In addition to the conventional teaching methodologies following interactive strategies will also be introduced to improve both communication and clinical skills in the upcoming consultants:

1. Monthly Student Meetings

Each affiliated Hospital approved to conduct training for DOMS will provide a room for student meetings/discussions such as

- a. Journal Club Meeting
- b. Core Curriculum Meetings
- c. Skill Development
- d. Interactive Sessions

a. Journal Club Meeting

Two hours per month should be allocated to the presentation and discussion of a recent Journal article related to Eye Diseases. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department of each medical college. Students of different medical colleges may be given an opportunity to share all such interesting articles with each other.

b. Core Curriculum Meetings

All the core of DOMS should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. It should be chaired by the Chief Student (elected by the students of the relevant diploma). Each student should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure.

c. Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

List of skills to be learnt during these sessions is as follows:

1. Communication skills
2. Physical examination related to the Eye
3. Practical skills i.e., use of relevant clinical instruments
4. Presentation skills: Power point, lectures, small group discussions, article presentation etc.
5. Research and scientific writing
6. Management of eye related emergencies in Primary Care
7. Acquisition of instrumental skills like slit lamp examination, direct ophthalmoscopy, indirect examination, 90D examination, gonioscopy, use of microscope, refraction, ophthalmometer, Hess Test, keratometry, visual field, ultrasound etc., opportunities during ward postings should be availed

Annual Grand Meeting

Once a year all students enrolled for DOMS should be invited to the annual meeting at RMU Rawalpindi.

One full day will be allocated to this event. All the chief students will present their annual reports.

Issues and concerns related to their relevant diploma courses will be discussed. Feedback may be collected and also suggestions can be sought in order to involve students in decision making. The research work and their literary work may also be displayed.

In the evening an informal get together and dinner should be arranged.

This will help in creating a sense of belonging and ownership among students and the faculty.

Clinical/Community Ophthalmology Rotations

To give maximum exposure and enhance skills of the DOMS trainees, the candidates will have monthly rotations in all the allied hospitals of Rawalpindi Medical University, Rawalpindi. In addition to these rotations to give maximum exposure of community ophthalmology and to gain better understanding of working at the DHQ and THQ levels at primary/secondary health care, the candidates will serve rotation period of three months in the THQs/DHQs in surrounding areas of Rawalpindi during their course of two years training.

Literature Review

Students will be assigned a clinical problem; commonly encountered in the relevant specialty and will be specifically trained to review literature in the pertinent field and write a 'Review of an Article' comprising of:

- Topic
- Introduction
- Discussion of the reviewed literature
- Conclusion
- References

Examinations

Assessment

It will consist formative assessment (360-degree evaluation and work place-based assessment) and summative assessment.

Formative Assessment

a) 360-Degree Evaluation

i. Student-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to 'own' the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented. In the proposed curriculum, it will be based on:

- Self-Assessment by the student
- Peer Assessment
- Informal Internal Assessment by the Faculty

ii. Self-Assessment by the Student

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

iii. Peer Assessment

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

iv. Informal Internal Assessment by the Faculty

There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.

It will include:

- a. Punctuality
- b. Ward work

c. Monthly assessment (written tests to indicate particular areas of weaknesses)

d. Participation in interactive sessions

v. **Feedback to the faculty by the students:**

After every three months students will be providing written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

b) Work place-based assessment (WPBA)

i. Mini-CEX

ii. DOPS

Summative Assessment

It will be carried out at the end of the programme to empirically evaluate **cognitive, psychomotor** and **affective domains** in order to award diplomas for successful completion of courses.

Eligibility to Appear in Final Examination

- Only those candidates will be eligible to take final examination, who have passed Midterm assessment (after 12 months of education) and have completed two years of structured/supervised training programme.
- Students who have completed their log books and hold certificates of 75% attendance may be allowed to sit for the exam
- The application for the final examination will be forwarded with recommendation of the supervisor
- Only those candidates who qualify in theory will be called for clinical examination

First Year in Training Assessment

Tabulated TOS

Topic	MCQs
Anatomy of Orbit and its application pertaining to diseases and surgical procedures	10
Physiology of eyeball and adnexa and structures as applied to or affected by disease process	10
Pathology General/Special Pathology (10 MCQ) Microbiology, Interpretation of Laboratory Test (10 MCQ)	05
Ocular Pharmacology	10
Principles of General Surgery	10
Behavioral Sciences	05
Biostatistics and Research Methods	05
Light	05
Reflection	05
Laws	05
Plain surface	05
Lenses and Curved Surface	10
Total internal reflection	05
Principals of refraction	05
Prisms	05
Total MCQs	100

First Year in Training Assessment

Exam at the end of 1st year

Written: 100 MCQs, 1 Mark each

TOTAL Written Marks 100

OSPE: 10 Stations (5xOptics n Refraction, 5x Ophthalmology)

5 Mark Each

TOTAL OSPE Marks 50

TOTAL Marks =Written + OSPE = 100+50= 150

Final Assessment Tabulated TOS

TOPIC	SEQs	MCQs
Neuroophthalmological	5	25
Medical Ophthalmology	5	25
Differential Diagnosis	1	5
Cornea	1	5
Lids	1	5
Conjunctiva	1	5
Lens	1	5
Glaucoma	1	5
Uveal Tract	1	5
Retina	1	5
Lacrimal Apparatus	1	5
Ocular Motility	1	5
Total	20	100

Final Assessment

Exam at the end of 2nd year

Written: 100 MCQs, 1 Mark each

20 SEQs, 5 Mark each

Total Written Marks 200

OSPE: 10 Stations, 5 Mark Each

Total OSPE Marks 50

Total Marks PART II =Written + OSPE = 200+50= 250

Each component of practical examination will be assessed by two examiners awarding marks simultaneously and independently. The final score awarded will be an average score, as agreed by both examiners.

Pass Percentage and Other Regulations Regarding Examination

- Criterion referenced assessment principles will be used
- 20 marks for the log book will be included in the OSCE component
- 60% marks will be a pass score in each component
- Candidates failing in any one component will have to re-sit the entire examination
- A maximum of 5 attempts to sit for the examination will be allowed, to be availed within 3 calendar years of the first attempt
- Re-admission in DOMS course is not permissible under any circumstances
- The results will be announced according to rules and regulations set by the Examination Branch of Rawalpindi Medical University.

Recommended Books

Anatomy

1. Snell R. S., Lamp M. A. Clinical Anatomy of Eye.
2. Wolf's Anatomy of the Eye
3. Newell F. W. Ophthalmology Principles and Concepts.

Optics and Refraction

1. Elkington A. R., Frank H. J., Greaney M. J. Clinical Optics.
2. Duke-Elder. Practice of Refraction.

Physiology

1. Guyton. Textbook of Medical Physiology.
2. Newell F. Ophthalmology Principles and Concepts.
3. Adler's Physiology of the Eye. (For reference)

Pathology

1. Apple D. J., Rabb M. F. Ocular Pathology.
2. Gree. Ocular Pathology

Clinical Ophthalmology

- 1) Kanski J. J. Clinical Ophthalmology.
- 2) The Wills Eye Manual
- 3) Oxford Handbook of Ophthalmology
- 4) American academy of Ophthalmology.

Ophthalmic Surgery

Newell F. W. **Ophthalmology Principles and Concepts**

Ophthalmic Surgery

Willshaw H. **Practical Ophthalmic Surgery.**

Bailey and Love. **Short Practice of Surgery.**

Rana M. H., Ali S. Mustafa M. **A Handbook of Behavioral Sciences for Medical and Dental students.**

Fathalla M. F. and Fathalla M. M. F. **A Practical Guide for Health Researcher.** Cairo: World Health Organization; 2004.

Journals

1. Archives of Ophthalmology (AMA USA)
2. British Journal of Ophthalmology (UK)
3. Journal of Oculoplastic and Reconstructive Surgery (USA)
4. Retina (USA)
5. Eye RC Ophth (UK)