

**REGULATIONS AND CURRICULUM  
FOR  
POSTGRADUATE DEGREE AND DIPLOMA COURSES**

**2010**

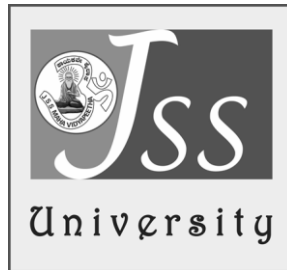


**OPHTHALMOLOGY**

**JSS UNIVERSITY  
JSS MEDICAL INSTITUTIONS CAMPUS  
SRI SHIVARATHREESHWARA NAGARA, MYSORE 570 015  
KARNATAKA, INDIA**

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OPHTHALMOLOGY

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# Postgraduate Medical Degree and Diploma Courses 2010

## OPHTHALMOLOGY

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## CHAPTER I

### Regulations for Postgraduate Degree and Diploma Courses in Medical Sciences

#### 1. Branch of Study

##### 1.1 Postgraduate degree courses

Post Graduate Degree courses may be pursued in the following subjects:

##### a) MD (Doctor of Medicine)

- i) Anaesthesiology
- ii) Anatomy
- iii) Biochemistry
- iv) Community Medicine
- v) Dermatology, Venereology and Leprosy
- vi) Forensic Medicine
- vii) General Medicine
- viii) Microbiology
- ix) Pathology
- x) Paediatrics
- xi) Pharmacology
- xii) Physiology
- xiii) Psychiatry

##### b) MS (Master of Surgery)

- i) General Surgery
- ii) Obstetrics and Gynaecology
- iii) Ophthalmology
- iv) Orthopedics
- v) Oto-Rhino-Laryngology

##### 1.2 Postgraduate Diploma Courses

Post Graduate Diploma Courses may be pursued in the following subjects:

- a) Anesthaesiology (DA)
- b) Child Health (DCH)
- c) Clinical pathology (DCP)
- d) Dermatology, Venerology and Leprosy (DDVL)
- e) Obstetrics and Gynaecology (DGO)
- f) Ophthalmology (DO)
- g) Orthopaedics (D Ortho)
- h) Oto-rhino-laryngology (DLO)
- i) Psychiatry (DPM)

## **2. Eligibility for Admission**

**MD / MS Degree and Diploma courses** : A candidate affiliated to this University and who has passed final year MBBS examination after pursuing a study in a medical college recognized by the Medical Council of India, or from a recognized medical college affiliated to any other university recognized as equivalent thereto and has completed one year compulsory rotating internship in a teaching institution or other institution recognized by the Medical Council of India, and has obtained permanent registration of any State Medical Council, shall be eligible for admission.

## **3. Obtaining Eligibility Certificate by the University before making admission**

No candidate shall be admitted for any Postgraduate Degree/Diploma courses unless the candidate has obtained and produced the eligibility certificate issued by the University. The candidate has to make an application to the University with the following documents along with the prescribed fee:

- a) MBBS pass/degree certificate issued by the university.
- b) Mark cards of all the university examinations passed before MBBS course.
- c) Attempt certificate issued by the Principal.
- d) Certificate regarding the recognition of the medical college by the Medical Council of India
- e) Completion of internship certificate.
- f) In case internship was done in a non- teaching hospital, a certificate from the Medical Council of India that the hospital has been recognized for internship.
- g) Registration by any state Medical Council.
- h) Proof of ST/SC or Category I, as the case may be.

Candidates should obtain the eligibility certificate before the last date for admission as notified by the university.

A candidate who has been admitted to postgraduate course should register his / her name in the university within a month of admission after paying the registration fee.

## **4. Intake of students**

The intake of students to each course shall be in accordance with the MCI and GOI permissions in this regard.

## **5. Course of study**

### **5.1 Duration**

- a) **MD, MS Degree Courses:** The course of study shall be for a period of 3 years consisting of 6 terms.
- b) **Diploma courses:** The course of study shall be for a period of 2 years consisting of 4 terms.

## **6. Method of training**

The training of postgraduate for degree/diploma shall be residency pattern, with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

## **7. Attendance, Progress and Conduct**

- 7.1** A candidate pursuing degree/diploma course, should work in the concerned department of the institution for the full period as full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course, nor can he/she work in a nursing home or other hospitals/clinic/laboratory while studying postgraduate course.
- 7.2** Each year shall be taken as a unit for the purpose of calculating attendance.
- 7.3** Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- 7.4** Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided, further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year.
- 7.5** Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

## **8. Monitoring Progress of Studies:**

- 8.1 Work diary / Log Book:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the

candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

- 8.2 Periodic tests:** In case of degree courses of three years duration (MD/MS, DM, M Ch.), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other at the end of the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University, when called for.
- 8.3** In case of diploma courses of two years duration, the concerned departments may conduct two tests, one of them at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.
- 8.4 Records:** Records and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

## **9. Dissertation**

- 9.1** Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
- 9.2** The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.
- 9.3** Every candidate shall submit to the Director (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course, on or before the dates notified by the University. The synopsis shall be sent through proper channel.
- 9.4** Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.



**9.5** The dissertation should be written under the following headings:

- a) Introduction
- b) Aims or Objectives of study
- c) Review of Literature
- d) Material and Methods
- e) Results
- f) Discussion
- g) Conclusion
- h) Summary
- i) References
- j) Tables
- k) Annexure

**9.6** The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

**9.7** Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination, on or before the dates notified by the University.

**9.8** The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

**9.9 Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post graduate teachers.

**Co-Guide:** A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by JSS University / Medical Council of India. The co-guide shall be a recognised post graduate teacher of JSS University.

**9.10 Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

## 10. Schedule of Examination

The examination for MD / MS courses shall be held at the end of three academic years (six academic terms). The examination for DM and M Ch courses shall be held at the end of three years. The examination for the diploma courses shall be held at the end of two academic years (four academic terms). For students who have already passed Post Graduate Diploma and appearing for MD examination, the examination shall be conducted after two academic years (four academic terms, including submission of dissertation) The University shall conduct two examinations in a year at an interval of four to six months between the two examinations. Not more than two examinations shall be conducted in an academic year.

## 11. Scheme of Examination

### 11.1 MD / MS Degree

MD / MS Degree examinations in any subject shall consist of dissertation, written paper (Theory), Practical/Clinical and Viva voce.

11.1.1 **Dissertation:** Every candidate shall carryout work and submit a dissertation as indicated in SI NO 9. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

11.1.2 **Written Examination (Theory):** A written examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects should also be asked.

11.1.3 **Practical / Clinical Examination:** In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing student's ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The total marks for Practical / clinical examination shall be 200.

11.1.4 **Viva Voce.** Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

- i) For examination of all components of syllabus 80 Marks
  - ii) For Pedagogy 20 Marks
- If there is skills evaluation, 10 marks shall be reserved for Pedagogy and 10 marks for skill evaluation.

11.1.5 **Examiners.** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.1.6 **Criteria for declaring as pass in University Examination\*.** A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva-voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.1.7 **Declaration of class:** A successful candidate passing the University examination in first attempt and secures grand total aggregate 75% of marks or more will be declared to have passed the examination with distinction, 65% but below 75% declared as First Class and 50% but below 65% declared as Second Class.

A candidate passing the University examination in more than one attempt shall be declared as Pass Class irrespective of the percentage of marks.

## 11.2 DM/M Ch

The examination shall consist of theory, clinical/practical and viva voce examination.

11.2.1 **Theory (Written Examination):** The theory examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the first paper will be on basic medical sciences. Recent advances may be asked in IV Paper.

11.2.2 **Practical / Clinical Examination:** In case of practical examination it should be aimed at assessing competence, skills of techniques and procedures as well as testing student's ability to make relevant and valid observations, interpretations and experimental work relevant to his / her subject.

In case of clinical examination it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The maximum marks for Practical / Clinical shall be 200.

11.2.3 **Viva-Voce:** Viva Voce examination shall aim at assessing thoroughly, depth of knowledge, logical reasoning, confidence and oral communication skills. The maximum marks shall be 100. This also includes spotters like instruments, anaesthesia machines, drugs, ECG, X – ray.

11.2.4 **Examiners:** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

11.2.5 **Criteria for declaring as pass in University Examination\*:** A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) Practical including clinical and viva voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

### **11.3 Diploma Examination:**

Diploma examination in any subject shall consist of theory (written papers), Practical / Clinical and Viva - Voce.

11.3.1 **Theory:** There shall be three written question papers each carrying 100 marks. Each paper will be of three hours duration. In clinical subjects one paper out of this shall be on basic medical sciences. In basic medical subjects and Para- clinical subjects, questions on applied clinical aspects should also be asked.

11.3.2 **Practical Clinical Examination:** In case of practical examination it should be aimed at assessing competence, skills related to laboratory procedures as well as testing students ability to make relevant and valid observations, interpretation of laboratory or experimental work relevant to his/her subject.

In case of clinical examination, it should aim at examining

clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The maximum marks for Practical / Clinical shall be 150.

11.3.3 **Viva Voce Examination.** Viva Voce examination should aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50. This also includes spotters like instruments, anesthesia machines, drugs, ECG, X-ray.

11.3.4 Criteria for declaring as pass in University Examination\* A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).

11.3.5 **11.3.5 Declaration of distinction.** A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

11.3.6 **Examiners.** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

## **12. Number of Candidates per day**

The maximum number of candidates for practical / clinical and viva-voce examination shall be as under:

**MD /MS Course:** Maximum of 6 per day.

**Diploma Course:** Maximum of 8 per day.



## **CHAPTER II**

### **GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM**

#### **GOAL**

The goal of postgraduate medical education shall be to produce competent specialists and/or medical teachers:

1. Who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
2. Who shall have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
3. Who shall be aware of the contemporary advance and developments in the discipline concerned.
4. Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology and
5. Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

#### **GENERAL OBJECTIVES**

At the end of the postgraduate training in the discipline concerned the student shall be able to:

1. Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.
2. Practice the speciality concerned ethically and in step with the principles of primary health care.
3. Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
4. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
5. Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

6. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
7. Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
8. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
9. Play the assigned role in the implementation of national health programme, effectively and responsibly.
10. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
11. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
12. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
13. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
14. Function as an effective leader of a health team engaged in health care, research or training.

**STATEMENT OF THE COMPETENCIES:** Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

**COMPONENTS OF THE POSTGRADUATE CURRICULUM:**

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Thesis skills.
- Attitudes including communication skills.
- Training in research methodology.

(Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2000)



## CHAPTER III

### M S OPHTHALMOLOGY

#### **Goal:**

The Master's Course in Ophthalmology is a 3-year integrated course, after satisfactory completion of which the candidate shall be able to practice ophthalmology competently and safely in the community that he/she serves.

**Objectives of the course:** With the knowledge and skills developed at the completion of the course, the candidate shall be able to:

1. Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, for common as well as referred conditions.
2. Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his /her practice.
3. Be aware of his / her limitations to the application of the specialty in situations which warrant referral to major centers or individuals more qualified to treat.
4. Apply research and epidemiological methods during his / her practice. The candidate shall be able to present or publish work done by him/her.
5. Contribute as an individual/or in a group or institution towards the fulfillment of national objectives with regard to prevention of blindness.
6. Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.
7. Effectively communicate with colleagues.

#### **Course Contents**

##### **Essential theoretical knowledge**

These are only broad guidelines and are illustrative; there may be overlap between sections.

##### **1. The Basic Sciences:**

- a) Orbital and ocular anatomy
  - i) Gross anatomy
  - ii) Histology
- b) Ocular Physiology
- c) Pathology
  - i) General pathology
  - ii) Ocular pathology: gross pathology, histopathology.

- d) Biochemistry: general biochemistry, biochemistry applicable to ocular function.
- e) Microbiology
  - i) General microbiology
  - ii) Specific microbiology applicable to the eye
  - iii) Immunology with particular reference to ocular immunology
- f) Geometric and ophthalmic optics
  - i) Basic physical optics
  - ii) Ophthalmic optics
  - iii) Applied optics including optical devices

## **2. Clinical Ophthalmology**

- a) Disorders of refraction
- b) Disorders of the lids
- c) Disorders of the lacrimal system
- d) Disorders of the conjunctiva
- e) Disorders of the sclera
- f) Disorders of the cornea
- g) Disorders of the uveal Tract
- h) Disorders of the lens
- i) Disorders of the retina
- j) Disorders of the optic nerve & visual pathway
- k) Disorders of the orbit
- l) Glaucoma
- m) Neuro ophthalmology
- n) Paediatric ophthalmology
- o) Systemic ophthalmology (ocular involvement in systemic disease)
- p) Immune ocular disorders
- q) Strabismus & amblyopia

## **Essential diagnostic skills - instrumentation**

- **Tonometry**
  - Applanation
  - Indentation (commonly Schiottz)
- **Assessment of epiphora**
  - Jone's dye test
  - Syringing - performance & interpretation
- **Dry eye evaluation**
  - Schirmer's test
  - Rose Bengal staining
  - Tear film breakup time
  - Tear meniscus evaluation

- **Corneal ulceration**
  - Taking a corneal scraping
  - Inoculation into media
  - Evaluation of Gram's stain
  - Evaluation of KOH preparation
  - Corneal wedge biopsy
- **Direct ophthalmoscopy**
  - Distant direct
  - Media assessment
  - Use of filters provided
- **Indirect ophthalmoscopy**
  - Scleral depression
  - Fundus drawing capability
  - Use of filters provided
- **Slit Lamp Examination**
  - Diffuse examination
  - Focal examination
  - Retro illumination — direct & indirect
  - Sclerotic scatter
  - Specular reflection
  - Staining modalities and interpretation
- **Slit Lamp Accessories:**
  - Applanation tonometry
    - Goldman's applanation
  - Gonioscopy
    - Single mirror gonioscope
    - Gonioprism
    - Grading of the angle
    - Testing for occludability
    - Indentation gonioscopy
  - 3- mirror examination of the fundus
  - 78-D / 90-D / 60-D examination
  - Hruby lens examination
  - Optical pachymetry
  - Slit lamp photography
- **Colour vision evaluation**
  - Ishihara pseudo-isochromatic plates
  - Other tests including
    - Farnsworth - Munsell 100 - hue or 15 - hue tests
    - Holmgren's wools
    - Edridge -Green lantern

- **Use of Amsler's charting**
  - Instructing in the use of and interpreting the chart.
- **Corneal topography and corneal mapping**
  - Interpretation of corneal topography mapping
- **Specular microscopy of the corneal endothelium**
- **Keratometry**
  - Performance & interpretation of keratometry
  - Diagnosis of situations such as keratoconus
  - Keratoscopy
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
  - Doing and evaluating stereoscopic fundus photographs
  - Performance of and interpretation of FFA
  - Performance of indirect fluorescein angiography
- **Refraction**
  - Retinoscopy
  - Streak retinoscopy
  - Use of trial set
  - Use of Jackson's cross-cylinder
  - Subjective and objective refraction
- **Autorefractometry**
  - Use of and interpretation of auto-refractometer
- **Diagnosis & assessment of Squint**
  - Ocular position and motility examination
  - Versions, ductions, and vergences
  - Convergence facility estimation
  - Cover / uncover / alternate cover test
  - Use of prism bars or free prisms in assessment of squint
  - Use of synaptophore / major amblyoscope
  - Use of Bagolini's striated glasses / red filters / Maddox rod
  - Use of Worth's four dot test
  - Use of minor amblyoscope
  - Use & interpretation of the Hess chart / Lees' screen
  - Performance & interpretation of diplopia charting
  - Diagnosis of amblyopia
- **Exophthalmometry**
  - Use of Hertel's exophthalmometer
  - Use of Luedde's exophthalmometer
  - Use of other exophthalmometers
  - Measurement of proptosis or exophthalmos

- **Use and evaluation of ophthalmic ultrasound**
  - A- scan ultrasound with biometry
  - B- scan ultrasound: performance & interpretation
  
- **Interpretation of perimetry**
  - Tangent screening
  - Goldman perimeter & interpretation
  - Static computerized perimetry
    - Interpretation of commonly managed problems
  
- **Radiology**
  - Interpretation of plain skull films
    - PA-20 ( Caldwell's view )
    - PNS ( Water's view )
    - Lateral
    - Submentovertical
    - Optic canal views
    - Localisation of intra ocular and intra orbital FBs
  - Interpretations of contrast studies
    - Performance & interpretation of dacryocystograms
    - Performance and interpretations of orbital venograms
    - Interpretation of carotid angiograms
  - Interpretation of CT - Scans & MRI Scans
    - Orbital CT interpretation & orbital MRI evaluation
    - Brain CT interpretation

### Essential surgical skills

Procedure	Nature of activity* & number			
	O	A	PA	PI
1. Operating theatre				
a. Anaesthesia :				
i. Retrobulbar anaesthesia	-	-	20	20
ii. Peribulbar anaesthesia	-	-	20	20
iii. Parabolbar anaesthesia	✓	-	-	-
iv. Facial blocks				
• O' Breins	-	-	-	20
• Atkinsons	-	-	-	5
• Van Lints & modifications	-	-	-	5
v. Frontal blocks	-	-	-	2
vi. Infra orbital blocks	-	-	-	1
vii. Blocks for sac surgery	-	-	-	5

Procedure	Nature of activity* & number			
	O	A	PA	PI
b. Magnification :				
i. Operating microscope familiarity with use is essential	-	-	-	✓
ii. Operating loupe				
c. Lid surgery :				
i. Tarsorrhaphy	-	-	-	10
ii. Ectropion and entropion procedures	-	-	-	2
iii. Ptosis surgery	-	2	-	-
iv. Lid repair following trauma and surgical excision of lid for tumours etc	-	-	2	-
v. Epilation, electrolysis, cryotherapy etc	-	-	-	10
d. Destructive procedures :				
i. Evisceration with or without implant	-	-	-	3
ii. Enucleation with or without implant	-	-	-	5
iii. Modified enucleation procedures for intraocular tumours		-	1	-
e. Sac surgery				
i. Dacryocystectomy	-	-	-	2
ii. Dacryocystorhinostomy	-	-	-	3
iii. Probing for congenital obstruction of nasolacrimal duct	-	-	1	-
f. Extraocular muscle surgery				
i. Recession and resection procedures on the horizontal recti	-	-	2	-
g. Cataract surgery				
i. Standard ECCE with or without IOL implantation	-	-	-	10
ii. Small incision ECCE with or without IOL implantation	✓			
iii. Membranectomy	✓			
iv. Secondary AC or PC IOL implantation	✓			
v. Phacoemulsification	✓			
vi. Intra capsular cataract extraction	✓			
vii. Vectis extraction		-	1	-

Procedure	Nature of activity * & number			
	O	A	PA	PI
h. Retinal surgery				
i. Needs to know how to assist in procedures such as buckling	-	1	-	-
ii. Prophylactic cryotherapy	✓	-	-	-
i. Orbit surgery				
i. Anterior orbitotomy for diagnostics and therapy	✓	-	-	-
ii. Lateral orbitotomy for tumours	✓	-	-	-
iii. Incision and drainage via anterior orbitotomy for abscess	-	1	-	-
iv. Exenteration	✓	-	-	-
v. Fine needle aspiration biopsy of orbital disease	✓	-	-	-
(if experienced pathologist is available)				
j. Vitrectomy				
i. Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.	-	-	2	-
ii. Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication	-	-	-	2
iii. Automated vitrectomy	✓			
iv. Assist vitrectomy surgeon if facility exists.				
k. Keratoplasty				
i. Assisting or doing penetrating keratoplasty (therapeutic, optical)	-	-	1	-
ii. Lamellar keratectomy	✓	-	-	-
l. Glaucoma surgery				
i. Trabeculectomy	-	-	-	3
ii. Pharmacological modifications of trabeculectomy				
iii. Goniotomy				
iv. Cyclocryotherapy and other cyclodestructive procedures	-	-	-	2

Procedure	Nature of activity * & number			
	O	A	PA	PI
m. Surface ocular procedures				
i. Pterygium excision with modifications	-	-	-	5
ii. Conjunctival grafting	-	-	2	-
iii. Biopsy of cornea and conjunctiva	-	-	-	1
n. Pterygium excision	-	-	-	10
o. Tarsorrhaphy	-	-	-	10
p. Retrobulbar, parabulbar anaesthesia	-	-	-	20
2. Outpatient :				
a. Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection, conjunctival scraping etc.	-	-	-	10
b. Conjunctival and corneal foreign body removal on the slit lamp	-	-	-	10
c. Chalazion incision and curettage	-	-	-	10
d. Biopsy of small lid and tumours	-	-	3	-
e. Suture removal skin, conjunctival, corneal and corneoscleral	-	-	-	5
f. Subconjunctival injection	-	-	-	10
g. Posterior Sub- Tenon's injections	-	-	-	5
h. Artificial eye fitting	-	-	-	5
i. Laser procedures	✓	-	-	-
i. Laser capsulotomy	✓	-	-	-
ii. Laser iridotomy	✓	-	-	-
iii. Laser trabeculoplasty	✓	-	-	-
iv. Panretinal photocoagulation	✓	-	-	-
v. Focal photocoagulation	✓	-	-	-

\* The procedures that the student should have:

O = Washed and observed

A = Assisted the operating surgeon

PA= Performed with assistance

PI = performed independently

### Essential Research Skills

#### 1. Basic statistical knowledge

- a. Ability to undertake clinical & basic research.
- b. Descriptive and Inferential statistics.
- c. Ability to publish results of one's work.

#### 2. Ability to constructively criticize publications in the field and without.

3. This could be achieved during the course by attending workshops on Research methodology, basic statistics classes and regularly having Journal Clubs etc where selected articles could be taken and evaluated for quality and presentation of the content.



## **Other skills required**

1. Contact lenses
  - a) Assessment.
  - b) RGP fitting.
  - c) Soft lens fitting.
  - d) Troubleshooting.
2. Subjective correction of refraction
  - a. Techniques of subjective correction.
  - b. Knowledge of basic optical devices available and relative advantages and disadvantages of each.
3. Low vision aids.
  - a. The basics of fitting with knowledge of availability & cost.
4. Community ophthalmology.
  - a. Ability to organize institutional screening
  - b. Ability to organize peripheral eye screening camps
  - c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness
5. Presentation
  - a. Ability to present one's work effectively at various scientific fora particularly free papers in scientific conferences within allotted framework of time
6. Organisation
  - a. Ability to organize meetings, seminars and symposia
  - b. Ability to get along with colleagues and work as a team with the other members of the department.
  - c. Ability to interact with and work as a team with other disciplines that may exist in the same hospital.
7. Communication skills
  - a. With patients
  - b. With colleagues
8. Record keeping
  - a. The ability to maintain records as scientifically as possible
  - b. Knowledge of computer software is helpful
9. Teaching
  - a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

## Year-wise structured training schedule

### First year:

#### 1. Theoretical knowledge

- a. Basic sciences should be addressed during this period
- b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
- c. Clinical ophthalmology.

#### 2. Clinical examination and diagnostics

- a. The basics of history taking, order and correct methods of examination and recording have to be learnt during this time.
- b. Clinical and surgical decision making is encouraged under supervision.

#### 3. Diagnostics

- a. All procedures in bold should as far as possible be done and the student should be fairly conversant with most of the techniques marked in bold.

#### 4. Surgery

- a. Extra ocular surgery including
  - i. Destructive procedures must have been done independently with or without assistance
  - ii. Local anaesthesia ( retrobulbar and peribulbar blocks )
  - iii. Subconjunctival injections
  - iv. Assisting for squint surgery
  - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
  - vi. Chalazion and pterygium surgery.
  - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
  - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures.
  - ix. Cataract surgery :
    - Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
    - At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

### Second year:

#### 1. Theoretical Knowledge :

- a. Here stress will be laid on clinical ophthalmology

#### 2. Clinical examination and diagnostics

- a. The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage

most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

### **3. Diagnostics**

- a. The student should be conversant and at ease with most if not all the diagnostic procedures outlined in bold in the section on "Essential diagnostic skills- instrumentation". Other procedures are optional skills if facility is available in the department. This is particularly so for the Master's candidate. However, as far as possible, it is advisable to make all such facility available in the department.

### **4. Surgical skills**

- a. At the end of the second year, the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications (management of vitreous loss).
- b. He/she should have performed the basic anti glaucoma procedures such as trabeculectomy either with assistance or under supervision
- c. Extra ocular surgery such as squint surgery could be performed with assistance.
- d. In addition, lacrimal sac surgery such as dacryocystectomy, dacryocystorhinostomy should be possible with assistance or under supervision.
- e. In addition, the Master's candidate should ideally have assisted in the other surgery such as retinal surgery, vitrectomy, orbit surgery, advanced oculoplastic surgery etc.

### **5. Conferences and workshops**

- a. The candidate should have attended one or two regional workshops and one national conference if possible. Presentation of a free paper at these venues is to be encouraged.

## **Third year:**

### **1. Theoretical knowledge :**

- a. Should be thorough with basic clinical ophthalmology with extensive and intensive reading

### **2. Clinical examination and diagnostics**

- a. Should be conversant with all aspects of clinical examination and decision making. Independent decision making and investigational and management freedom should be given at this stage for the more usual

situations. However, complex cases could be discussed with consultant and degree of freedom of decision making is left to the consultant's discretion.

### **3. Surgical skills**

- a. Routine skills are honed during this period.
- b. Cataract surgery should be done independently without supervision or assistance.
- c. Antiglaucoma surgery may be done.
- d. Can assist other procedures such as Retinal surgery, orbit surgery etc. The choice of doing the surgery with assistance and supervision should be left to the discretion of the consultant.

### **4. Conferences and workshops**

- a. The candidate by this time should have attended at least one national conference. He / she should be given time off to attend regional workshops and conferences particularly those dealing with the state of art.

### **Rotation and Posting in other Departments**

In institutions where subspecialties are not being usually performed, (eg VR surgery, orbit surgery etc.), students could be deputed for a month or so in institutions in which these specialities are highly developed.

For an MS student, optional rotation postings to allied departments would Include:

- Plastic Surgery
- Neurology / Neurosurgery
- Intensive Care
- ENT

However, posting to these allied specialities would depend upon the head of department's discretion. The total duration of posting should not exceed 4 months.

### **Teaching-Learning Activities**

#### **1. Clinical Case discussions**

- a. Every effort should be made to include as wide a variety of cases as possible over two years with multiple repetitions.
- b. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.
- c. Case presentation at other in-hospital multidisciplinary fora may be done.

## **2. Seminars**

- a. Seminars should be conducted at least once weekly. The topics selected should be repeated once in 2 years so as to cover as wide a range of topics as possible.
- b. Seminars could be individual presentations or a continuum (large topic) with many candidates participating.
- c. Each candidate shall present at least four seminar a year and a total of 12 seminars in 3 years

## **3. Journal Clubs**

- a. This also should be a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Indexed journals are recommended.
- b. Each candidate shall present journals allotted at least four times in a year and a total of 12 such presentations be made in 3 years

## **4. CPC**

CPCs are extremely useful Clinico pathological exercises and two or more should be done every year.

## **5. Lectures**

- a. Lectures to candidates should be in the form of instructional courses at the beginning of the academic term. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management; slit lamp examination with accessories such as gonioscopy etc.
- b. Lectures could also be arranged round the year on subspecialty topics.
- c. During the course, the candidates should have one lecture / one seminar on National programs (eg. National Programme for Control of Blindness, Trachoma program etc.), International assistance schemes for execution of national program (DAN-PCB, Lion's International, Christoffel-Blunden Mission etc). These would be addressed to in detail, including current status etc. In addition, it would be useful to include a few lectures on other non-ophthalmic National programs being undertaken in the country.

## **6. Research Activities**

A candidate should learn to be conversant with journal browsing, medline search etc. to help in project and clinical and research work.

## **7. Dissertation & research meetings:**

Departmental meetings should be held to overview research work done, particularly satisfactory conduct and progress of dissertation topics. These could be conducted once in 3 months either as an additional activity or in lieu of 1 journal club.

## **8. Teaching skills:**

Every postgraduate student should be involved in undergraduate teaching also. One or two theory classes for undergraduates could be attended and one or two theory classes could be taken for undergraduates for selected topics.

Undergraduate clinical teaching is another teaching skill that the student should pick up during the course. At least five to six undergraduate clinical class should be taken by the final year student (MS) before his/her course is over. This may be supervised by a consultant if necessary.

## **9. Orientation program:**

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities, working systems, library usage, lab protocols etc.

Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

## **10. Dissertation:**

Every candidate pursuing MS degree course in ophthalmology is required to carry out work on a selected research project under the guidance of recognised postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

- a. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
- b. Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.
- c. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No changes in the dissertation topic or guide shall be made without prior approval of the University.
- d. The dissertation should be written under the following headings
  - i. Introduction
  - ii. Aims or Objectives of study
  - iii. Review of Literature
  - iv. Material and Methods
  - v. Results
  - vi. Discussion

- vii. Conclusion
  - viii. Summary
  - ix. References
  - x. Tables
  - xi. Annexure
- e. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
  - f. Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.
  - g. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.
  - h. **Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work shall be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining postgraduate degree, shall be recognised as postgraduate teachers.  
  
A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by the University / Medical Council of India. The co-guide shall be a recognised postgraduate teacher.
  - i. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.
  - j. For some more details regarding Guide etc please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

### **Monitoring of teaching and learning activities**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include: (1) Personal Attitudes, (2) Acquisition of Knowledge, (3) Clinical and operative skills, (4) Teaching skills and (5) Dissertation.

**1. Personal Attitudes.** The essential items are:

- a. Caring attitudes
- b. Initiative
- c. Organisational ability
- d. Potential to cope with stressful situations and undertake responsibility
- e. Trustworthiness and reliability
- f. To understand and communicate intelligibly with patients and others
- g. To behave in a manner which establishes professional relationships with patients and colleagues
- h. Ability to work in team
- i. A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

**2. Acquisition of Knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a. *Journal Review Meeting (Journal Club):* The ability to do literature search, in depth study, presentation skills, and use of audio-visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist ( see Model Checklist – I, Chapter IV)
- b. *Seminars / Symposia:* The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio-visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)
- c. *Clinico-pathological conferences:* This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.



### 3. Clinical skills

- a. *Day to Day work:* Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).
- b. *Clinical meetings:* Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).
- c. *Clinical and Procedural skills:* The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

**4. Teaching skills:** Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

**5. Dissertation in the Department:** Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

**6. Work diary /Log Book** - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

**7. Periodic tests:** The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may, include written papers, practicals / clinicals and viva voce.

**8. Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

### 9. Log book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training

programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

**Format for the log** book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

**Scheme of examination:**

**1. Theory (Written):**

There shall be four question papers, each of three hours duration, carrying 100 marks. Each paper shall consist of two long essay questions each carrying 20 marks and six short essay type of questions each carrying 10 marks. Questions on recent advances may be asked in any or of the papers. Details of distribution of topics for each paper will be as follows:

Paper I: Basic Sciences

- a. Anatomy of the eye & orbit
- b. Ocular physiology
- c. Ophthalmic pathology
- d. Microbiology & immunology
- e. Biochemistry relevant to ophthalmology
- f. Geometric and ophthalmic optics

Paper II:

- a. Disorders of Refraction
- b. Concomitant Strabismus and amblyopia disorders of the sclera
- c. Disorders of the uvea
- d. Immuno ocular disorders
- e. Disorders of the cornea
- f. Disorders of the conjunctiva

Paper III:

- a. Disorders of the orbit Disorders of the lids
- b. Disorders of the lacrimal system neuroophthalmology, paediatric ophthalmology

Paper IV :

- a. Glaucoma
- b. Systemic ophthalmology Disorders of the Retina Disorders of the Lens  
Community ophthalmology
- c. Ocular Pharmacology

**Note: The distribution of chapters / topics shown against the papers are suggestive only.**

**2. Clinical Examination:**

200 marks

A. Long case:

- a. Duration: 45 minutes — 1 hour
- b. Marks : 50 marks
- c. Type of case:
  - i. Neuro ophthalmology
  - ii. Proptosis
  - iii. Sclerokeratouveitis
  - iv. Uveitis with complications
  - v. Lens induced complications
  - vi. Glaucoma

B. Short cases:

- a. Two short cases of 25 marks each.
- b. Duration: 10 minutes — 15 minutes

C. Fundus cases:

- a. Two fundus cases
- b. Duration: 10 minutes — 15 minutes each
- c. Marks: 25 marks each
- d. Type of cases:
  - i. Rhegmatogenous retinal detachment
  - ii. Diabetic retinopathy, background & proliferative
  - iii. Vasculitis
  - iv. Tractional RD
  - v. Hypertensive retinopathy and combinations of the same with DR
  - vi. Mass lesions
  - vii. High myopia with degeneration
  - viii. Coloboma choroids, simple or with detachment
  - ix. Posterior uveitis, retinitis etc.
  - x. Pigmentary Retinopathy

D. Refraction:

- a. Two refraction cases of 25 marks each.

**3. Viva voce:** 100 marks

a) Students will be examined by all the examiners together about students comprehension of the components of course contents, analytical approach and

interpretation of data. This section will carry 80 marks. The examination will include the following:

- i. Community ophthalmology
- ii. Conjunctiva, Cornea, Lens
- iii. Uvea and Glaucoma
- iv. Neuro-ophthalmology & Systemic disorders
- v. Orbit & oculoplastics
- vi. Retina etc.
- vii. Surgical instruments
- viii. Pathology gross specimens
- ix. Pathology slides
- x. Microbiology slides
- xi. Radiology
- xii. Perimetry
- xiii. Miscellaneous

b) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate before the clinical examination. Each will make a presentation on the topic for 8 to 10 minutes.

c) During the viva-voce discussion on dissertation may be held. No marks are assigned as it would have been evaluated separately.

**Maximum marks**

Theory	Practical	Viva	Grand Total
400	200	100	700

## **Recommended Books and Journals:**

Recommended books:

1. Duane's System of Ophthalmology
2. Jakobiec Series
3. Peyman's Series
4. Pathology gross specimens Duke-Elder's System of Ophthalmology
5. American Academy Series
6. Podos & Yanoff Series
7. Jack Kanski: Clinical Ophthalmology
8. Cornea :
  - a. Smolin & Thoft
  - b. Grayson
  - c. Kaufman & Leibowitz
9. Glaucoma
  - a. Bruce Shields Text Book of Glaucoma
  - b. Krupin & Shields Series on Glaucoma
  - c. Becker & Schaeffer's Text Book of Glaucoma
  - d. Anderson's Computerised Perimetry
  - e. Harrington's Text Book of Perimetry
  - f. Leiberman and Drake : Computerised perimetry
10. Retinal disease:
  - a. Stephen Ryan's Retina
  - b. Ron Michel: Retinal Detachment
  - c. Steve Charles: Basic Vitrectomy
11. Ultra Sound:
  - a. Byrne & Ronald Green: Ophthalmic Ultrasound
12. Uvea:
  - a. Nussenblatt & Palestine
  - b. Smith & Nozik
13. Neuroophthalmology: a. Walsh & Hoyt
14. Orbital diseases:
  - a. Rootman's diseases of the orbit
  - b. Jakobiec & Snow — Diseases of the orbit
15. Tumours:
  - a. Jerry Shields - Diagnosis and management of orbital tumours
  - b. Jerry Shields - Diagnosis and management of ocular tumours

16. Strabismus:
  - a. Gunter von Noorden
  - b. Mein & Trimble
17. Ophthalmic Pathology:
  - a. Yanoff & Fine
  - b. Zimmerman
18. Pharmacology:
  - a. Havener
19. Anatomy:
  - a. Wolff
  - b. Snell's
20. 20. Physiology:
  - a. Adler's Physiology of the Eye
21. Biochemistry:
  - a. Standard text books
22. Immunology:
  - a. Ocular immunology
23. Paediatric ophthalmology
  - a. Kenneth Wright
24. Refraction:
  - a. Duke Elder's practice of refraction
  - b. Elkington & Frank

## **DIPLOMA IN OPHTHALMOLOGY (DO)**

### **Goal:**

The candidate shall be able to practice ophthalmology competently and safely in the community that he/she serves.

**Objectives of the course:** At the completion of the course, the candidate shall be able to:

1. Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common as well as easily managed situations at the District or secondary level of health service.
2. Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his /her practice.
3. Be aware of his / her limitations to the application of the specialty in situations which warrant referral to major centers or individuals.
4. Apply research and epidemiological methods during his / her practice. The candidate shall be able to present or publish work done by him/her.
5. Contribute as an individual/or in a group or institution towards the fulfillment of national objectives with regard to prevention of blindness.
6. Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.
7. Effectively communicate with colleagues.

### **Course Contents**

#### **Essential theoretical knowledge**

These are only broad guidelines and are illustrative; there may be overlap between sections.

#### **1. The Basic Sciences:**

- a) Orbital and ocular anatomy
  - i) Gross anatomy
  - ii) Histology
- b) Ocular Physiology
- c) Pathology
  - i) General pathology

- ii) Ocular pathology: gross pathology, histopathology.
- d) Biochemistry: general biochemistry, biochemistry applicable to ocular function.
- e) Microbiology
  - i) General microbiology
  - ii) Specific microbiology applicable to the eye
  - iii) Immunology with particular reference to ocular immunology
- f) Geometric and ophthalmic optics
  - i) Basic physical optics
  - ii) Ophthalmic optics
  - iii) Applied optics including optical devices

## **2. Clinical Ophthalmology**

- a) Disorders of refraction
- b) Disorders of the lids
- c) Disorders of the lacrimal system
- d) Disorders of the conjunctiva
- e) Disorders of the sclera
- f) Disorders of the cornea
- g) Disorders of the uveal Tract
- h) Disorders of the lens
- i) Disorders of the retina
- j) Disorders of the optic nerve & visual pathway
- k) Disorders of the orbit
- l) Glaucoma
- m) Neuro ophthalmology
- n) Paediatric ophthalmology
- o) Systemic ophthalmology (ocular involvement in systemic disease)
- p) Immune ocular disorders
- q) Strabismus & amblyopia

## **Essential diagnostic skills - instrumentation**

- **Tonometry**
  - Applanation
  - Indentation (commonly Schiottz)
- **Assessment of epiphora**
  - Jone's dye test
  - Syringing - performance & interpretation
- **Dry eye evaluation**
  - Schirmer's test
  - Rose Bengal staining
  - Tear film breakup time



- Tear meniscus evaluation
- **Corneal ulceration**
  - Taking a corneal scraping
  - Inoculation into media
  - Evaluation of Gram's stain
  - Evaluation of KOH preparation
- **Direct ophthalmoscopy**
  - Distant direct
  - Media assessment
  - Use of filters provided
- **Indirect ophthalmoscopy**
  - Scleral depression
  - Fundus drawing capability
  - Use of filters provided
- **Slit Lamp Examination**
  - Diffuse examination
  - Focal examination
  - Retro illumination - direct & indirect
  - Sclerotic scatter
  - Specular reflection
  - Staining modalities and interpretation
- **Slit Lamp Accessories:**
  - Applanation tonometry
    - Goldman's applanation
  - Gonioscopy
    - Single mirror gonioscope
    - Gonioprism
    - Grading of the angle
    - Testing for occludability
    - Indentation gonioscopy
  - 3- mirror examination of the fundus
  - 78-D / 90-D / 60-D examination
- **Colour vision evaluation**
  - Ishihara pseudo-isochromatic plates
- **Use of Amsler's charting**
  - Instructing in the use of and interpreting the chart.
- **Keratometry**
  - Performance & interpretation of keratometry
  - Diagnosis of situations such as keratoconus

- Keratotomy
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
  - Performance of and interpretation of FFA
  - Performance of indirect fluorescein angiography
- **Refraction**
  - Retinoscopy
  - Streak retinoscopy
  - Use of trial set
  - Use of Jackson's cross-cylinder
  - Subjective and objective refraction
- **Diagnosis & assessment of Squint**
  - Ocular position and motility examination
  - Versions, ductions and vergences
  - Convergence facility estimation
  - Cover / uncover / alternate cover test
  - Use of prism bars or free prisms in assessment of squint
  - Use of Bagolini's striated glasses / red filters / Maddox rod
  - Use of Worth's four dot test
  - Use of minor amblyoscope
  - Use & interpretation of the Hess chart / Lees' screen
  - Performance & interpretation of diplopia charting
  - Diagnosis of amblyopia
- **Exophthalmometry**
  - Measurement of proptosis or exophthalmos
- **Use and evaluation of ophthalmic ultrasound**
  - A- scan ultrasound with biometry
- **Interpretation of perimetry**
  - Static computerized perimetry
    - Interpretation of commonly managed problems
- **Radiology**
  - Interpretation of plain skull films
    - PA-20 (Caldwell's view)
    - PNS (Water's view)
    - Lateral
    - Submentovertical
    - Optic canal views
    - Localisation of intra ocular and intra orbital FBs
  - Interpretations of contrast studies
  - Interpretation of CT scans

- Orbital CT interpretation

### Essential surgical skills

Procedure	Nature of activity* & number			
	O	A	PA	PI
1. Operating theatre				
a. Anaesthesia :				
i. Retrobulbar anaesthesia	-	-	-	15
ii. Peribulbar anaesthesia	-	-	-	15
iii. Parabolbar anaesthesia	✓	-	-	-
iv. Facial blocks	✓	-	-	-
• O' Breins	-	-	-	15
• Atkinsons	-	-	-	15
• Van Lints & modifications	-	-	-	2
v. Frontal blocks	-	-	-	1
vi. Infra orbital blocks	-	-	-	1
vii. Blocks for sac surgery	-	-	-	3
b. Magnification :				
i. Operating microscope familiarity with use is essential	-	-	-	✓
c. Lid surgery :				
i. Tarsorrhaphy	-	-	-	5
ii. Ectropion and entropion procedures	-	-	-	1
iii. Lid repair following trauma	-	-	1	-
iv. Epilation	-	-	-	5
d. Destructive procedures :				
i. Evisceration with or without implant	-	-	-	1
ii. Enucleation with or without implant	-	-	-	3
e. Sac surgery				
i. Dacrocystectomy	-	-	-	2
ii. Dacryocystorhinostomy	-	-	-	1
iii. Probing for congenital obstruction of nasolacrimal duct	-	-	1	-
f. Extraocular muscle surgery				
i. Recession and resection procedures on the horizontal recti	-	-	1	-
g. Cataract surgery				
i. Standard ECCE with or without IOL	-	-	-	1

implantation				
Procedure	Nature of activity* & number			
	O	A	PA	PI
ii. Small incision ECCE with or without IOL implantation	✓	-	-	-
iii. Secondary AC or PC IOL implantation	✓	-	-	-
iv. Vectis extraction	-	-	1	-
h. Orbit surgery				
i. Incision and drainage via anterior orbitotomy for abscess	-	1	-	-
i. Vitrectomy				
i. Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.	-	-	1	-
ii. Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication	-	-	-	1
j. Keratoplasty				
i. Assisting penetrating keratoplasty (therapeutic, optical)	-	-	1	-
k. Glaucoma surgery				
i. Trabeculectomy	-	-	-	1
ii. Pharmacological modifications of trabeculectomy	-	-	-	-
iii. Cyclocryotherapy and other cyclodestructive procedures	-	-	-	1
l. Surface ocular procedures				
i. Pterygium excision with modifications	-	-	-	2
ii. Conjunctival grafting	-	-	1	-
m. Pterygium excision	-	-	-	2
n. Tarsorrhaphy	-	-	-	5
o. Retrobulbar, parabolbar anaesthesia	-	-	-	15
2. Outpatient :				
a. Manual diagnostic procedures such as syringing, corneal scraping, conjunctival	-	-	-	5

swab collection, conjunctival scraping etc.				
Procedure	Nature of activity* & number			
	O	A	PA	PI
b. Conjunctival and corneal foreign body removal on the slit lamp	-	-	-	5
c. Chalazion incision and curettage	-	-	-	5
d. Biopsy of small lid and tumours	-	-	1	-
e. Suture removal skin, conjunctival, corneal and corneoscleral	-	-	-	3
f. Subconjunctival injection	-	-	-	8
g. Posterior Sub- Tenon's injections	-	-	-	2
h. Artificial eye fitting	-	-	-	2

\* The procedures that the student should have:

O = Washed and observed

A = Assisted the operating surgeon

PA= Performed with assistance

PI = performed independently

### Essential Research Skills

1. Basic statistical knowledge
  - a. Ability to undertake clinical & basic research.
  - b. Descriptive and Inferential statistics.
  - c. Ability to publish results of one's work.
2. Ability to constructively criticize publications in the field and without.
3. This could be achieved during the course by attending workshops on Research methodology, basic statistics classes and regularly having Journal Clubs etc where selected articles could be taken and evaluated for quality and presentation of the content.

### Other skills required

1. Contact lenses
  - a. Assessment.
  - b. RGP fitting.
  - c. Soft lens fitting.
  - d. Troubleshooting.
2. Subjective correction of refraction
  - a. Techniques of subjective correction.
  - b. Knowledge of basic optical devices available and relative advantages and disadvantages of each.
3. Low vision aids.
  - a. The basics of fitting with knowledge of availability & cost.

#### 4. Community ophthalmology.

- a. Ability to organize institutional screening
- b. Ability to organize peripheral eye screening camps
- c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness

#### 5. Presentation

- a. Ability to present one's work effectively at various scientific fora particularly free papers in scientific conferences within allotted framework of time

#### 6. Organisation

- a. Ability to organize meetings, seminars and symposia
- b. Ability to get along with colleagues and work as a team with the other members of the department.
- c. Ability to interact with and work as a team with other disciplines that may exist in the same hospital.

#### 7. Communication skills

- a. With patients
- b. With colleagues

#### 8. Record keeping

- a. The ability to maintain records as scientifically as possible
- b. Knowledge of computer software is helpful

#### 9. Teaching

- a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

### **Academic activities:**

#### **Year-wise structured training schedule**

##### **First year:**

#### **1. Theoretical knowledge**

- a. Basic sciences should be addressed during this period
- b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
- c. Clinical ophthalmology.

#### **2. Clinical examination and diagnostics**

- a. The basics of history taking, order and correct methods of examination and recording have to be learnt during this time.

- b. Clinical and surgical decision making is encouraged under supervision.

### **3. Diagnostics**

- a. All procedures in bold should as far as possible be done and the student should be fairly conversant with most of the techniques marked in bold.

### **4. Surgery**

- a. Extra ocular surgery including
  - i. Destructive procedures must have been done independently with or without assistance
  - ii. Local anaesthesia ( retrobulbar and peribulbar blocks )
  - iii. Subconjunctival injections
  - iv. Assisting for squint surgery
  - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
  - vi. Chalazion and pterygium surgery.
  - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
  - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures.
  - ix. Cataract surgery :
    - Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
    - At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

### **Second year:**

### **5. Theoretical Knowledge :**

- a. Here stress will be laid on clinical ophthalmology

### **6. Clinical examination and diagnostics**

- a. The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

### **7. Diagnostics**

- a. The student should be conversant and at ease with all the diagnostic procedures outlined in bold in the section on "Essential diagnostic skills-instrumentation".

### **8. Surgical skills**

- a. At the end of the second year, the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications (management of vitreous loss).
- b. He/she should have performed the basic anti glaucoma procedures such as trabeculectomy either with assistance or under supervision
- c. Extra ocular surgery such as squint surgery could be performed with assistance.
- d. In addition, lacrimal sac surgery such as dacryocystectomy, dacryocystorhinostomy should be possible with assistance or under supervision.

### **Conferences and workshops**

- a. The candidate should have attended one or two regional workshops and one national conference if possible. Presentation of a free paper at these venues is to be encouraged.

### **Teaching-Learning Activities**

#### **1. Clinical Case discussions**

- a. Bedside discussion on the rounds, outpatient teaching in addition to these, clinical case discussion should form part of a department's schedule.
- b. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.
- c. Case presentation at other in-hospital multidisciplinary fora may be done.

#### **2. Seminars**

- a. Seminars should be conducted at least once weekly. The duration should be 1 to 1 ½ hours. The topics selected should be repeated once in 2 years so as to cover as wide a range of topics as possible.
- b. Seminars could be individual presentations or a continuum (large topic) with many candidates participating.
- c. Each candidate shall present at least three seminars a year and a total of six seminars in 2 years

#### **3. Journal Clubs**

- a. This also should be a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Indexed journals are recommended.



- b. Each candidate shall present journals allotted at least three times in a year and a total of six such presentations be made in 2 years

#### **4. CPC**

CPCs are extremely useful Clinico pathological exercises and two or more should be done every year.

#### **5. Lectures**

- a. Lectures to candidates should be in the form of instructional courses at the beginning of the academic term. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management; slit lamp examination with accessories such as gonioscopy etc.
- b. Lectures could also be arranged round the year on subspecialty topics.
- c. During the course, the candidates should have one lecture / one seminar on National programs (eg. National Programme for Control of Blindness, Trachoma program etc.), International assistance schemes for execution of national program (DAN-PCB, Lion's International, Christoffel-Blunden Mission etc). These would be addressed to in detail, including current status etc. In addition, it would be useful to include a few lectures on other non-ophthalmic National programs being undertaken in the country.

#### **6. Research Activities**

Every candidate may be allotted a departmental project either clinical or basic research, ongoing or afresh. A candidate should learn to be conversant with journal browsing, medline search etc. to help in project and clinical and research work.

#### **7. Rotation and Posting in other Departments**

In institutions where subspecialties are not being usually performed, (eg VR surgery, orbit surgery etc.), students could be deputed for a month or so in institutions in which these specialities are highly developed.

For a diploma student, optional rotation postings to allied departments would Include:

- Plastic Surgery
- Neurology / Neurosurgery
- Intensive Care
- ENT

The total duration of posting should not exceed 2 months.

#### **8. Orientation program:**

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities,

working systems, library usage, lab protocols etc.

Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

### **Monitoring of teaching and learning activities**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (1) Personal Attitudes, (2) Acquisition of Knowledge, (3) Clinical and operative skills, (4) Teaching skills and (5) Dissertation.

#### **1. Personal Attitudes:** The essential items are:

- a. Caring attitudes
- b. Initiative
- c. Organisational ability
- d. Potential to cope with stressful situations and undertake responsibility
- e. Trust worthiness and reliability
- f. To understand and communicate intelligibly with patients and others
- g. To behave in a manner which establishes professional relationships with patients and colleagues
- h. Ability to work in team
- i. A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

#### **2. Acquisition of Knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a. *Journal Review Meeting (Journal Club):* The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)
- b. *Seminars / Symposia:* The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of

audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

- c. *Clinico-pathological conferences:* This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

### **3. Clinical skills**

- a. *Day to Day work:* Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).
- b. *Clinical meetings:* Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).
- c. *Clinical and Procedural skills:* The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

**4. Work diary /Log Book** - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

**5. Periodic tests:** The departments may conduct two tests, one at the end of first year and the other in the second year, three months before the final examination. The tests may, include written papers, practical / clinical and viva voce.

**6. Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

### **7. Log book**

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

**Format for the log** book for the different activities is given in Tables 1, 2 and 3 of Chapter IV, Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

### **Scheme of examination:**

#### **1. Theory (Written):**

There shall be three question papers, each of three hours duration, carrying 100 marks. Each paper shall consist of two long essay questions each carrying 20 marks and six short essay type of questions each carrying 10 marks. Questions on recent advances may be asked in any or of the papers. Details of distribution of topics for each paper will be as follows:

##### Paper I: Basic Sciences

- a. Anatomy of the eye & orbit
- b. Ocular physiology
- c. Ophthalmic pathology
- d. Microbiology & immunology
- e. Biochemistry relevant to ophthalmology
- f. Geometric and ophthalmic optics
- g. Disorders of Refraction
- h. Concomitant Strabismus and amblyopia
- i. Paediatric ophthalmology
- j. Disorders of the Lens

##### Paper II:

- a. Disorders of the sclera
- b. Disorders of the uvea
- c. Immuno ocular disorders
- d. Disorders of the cornea
- e. Disorders of the conjunctiva

##### Paper III:

- a. Disorders of the orbit
- b. Disorders of the lids
- c. Disorders of the lacrimal system
- d. Neuroophthalmology
- e. Glaucoma
- f. Systemic ophthalmology
- g. Disorders of the Retina
- h. Community ophthalmology
- i. Ocular Pharmacology

**Note: The distribution of chapters / topics shown against the papers are suggestive only.**

**2. Clinical Examination:** 150 marks

A. Long case: One

- a. Marks : 50 marks
- b. Type of case:
  - i. Neuro ophthalmology
  - ii. Proptosis
  - iii. Sclerokeratouveitis
  - iv. Uveitis with complications
  - v. Lens induced complications
  - vi. Glaucoma
  - vii. other

B. Short cases: 50 marks

- a. Two short cases of 25 marks each.

C. Fundus cases:

- a. One fundus case
- b. Marks: 25 marks
- c. Type of cases:
  - i. Rhegmatogenous retinal detachment
  - ii. Diabetic retinopathy, background & proliferative
  - iii. Vasculitis
  - iv. Tractional RD
  - v. Hypertensive retinopathy and combinations of the same with DR
  - vi. Mass lesions
  - vii. High myopia with degeneration
  - viii. Coloboma choroids, simple or with detachment
  - ix. Posterior uveitis, retinitis etc.
  - x. Pigmentary Retinopathy

D. Refraction:

- a. One refraction case of 25 marks, duration 10 minutes. The candidate should perform retinoscopy on each eye.

**3. Viva voce:** 50 marks

a) Students will be examined by all the examiners together about students comprehension of the components of course contents, analytical approach and interpretation of data. The examination will include the following:

- i. Surgical instruments displayed
- ii. Pathology slides & Pathology gross specimens

- iii. Microbiology slides
- iv. Radiology
- v. Perimetry
- vi. Neuro-ophthalmology & Systemic disorders
- vii. Community ophthalmology
- viii. Uvea and Glaucoma
- ix. Conjunctiva, Cornea, Lens
- x. Orbit & oculoplastics
- xi. Miscellaneous

**Maximum marks**

Theory	Practical	Viva	Grand Total
300	150	50	500

## **Recommended Books and Journals:**

Recommended books:

1. Duane's System of Ophthalmology
2. Jakobiec Series
3. Peyman's Series
4. Pathology gross specimens Duke-Elder's System of Ophthalmology
5. American Academy Series
6. Podos & Yanoff Series
7. Jack Kanski: Clinical Ophthalmology
8. Cornea :
  - a. Smolin & Thoft
  - b. Grayson
  - c. Kaufman & Leibowitz
9. Glaucoma
  - a. Bruce Shields Text Book of Glaucoma
  - b. Krupin & Shields Series on Glaucoma
  - c. Becker & Schaeffer's Text Book of Glaucoma
  - d. Anderson's Computerised Perimetry
  - e. Harrington's Text Book of Perimetry
  - f. Leiberman and Drake : Computerised perimetry
10. Retinal disease:
  - a. Stephen Ryan's Retina
  - b. Ron Michel: Retinal Detachment
  - c. Steve Charles: Basic Vitrectomy
11. Ultra Sound:
  - a. Byrne & Ronald Green: Ophthalmic Ultrasound
12. Uvea:
  - c. Nussenblatt & Palestine
  - d. Smith & Nozik
13. Neuroophthalmology: a. Walsh & Hoyt
14. Orbital diseases:
  - c. Rootman's diseases of the orbit
  - d. Jakobiec & Snow — Diseases of the orbit
15. Tumours:
  - c. Jerry Shields - Diagnosis and management of orbital tumours
  - d. Jerry Shields - Diagnosis and management of ocular tumours
16. Strabismus:
  - c. Gunter von Noorden
  - d. Mein & Trimble

17. Ophthalmic Pathology:
  - c. Yanoff & Fine
  - d. Zimmerman
18. Pharmacology:
  - a. Havener
19. Anatomy:
  - c. Wolff
  - d. Snell's
20. 20. Physiology:
  - a. Adler's Physiology of the Eye
21. Biochemistry:
  - a. Standard text books
22. Immunology:
  - a. Ocular immunology
23. Paediatric ophthalmology
  - a. Kenneth Wright
24. Refraction:
  - c. Duke Elder's practice of refraction
  - d. Elkington & Frank



## CHAPTER IV

### Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring shall be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model checklists are given in this chapter which may be copied and used.

The learning out comes to be assessed should include:

1. Personal Attitudes.
2. Acquisition of Knowledge.
3. Clinical and operative skills and
4. Teaching skills.

**1. Personal Attitudes:** The essential items are:

- a. Caring attitude.
- b. Initiative.
- c. Organisational ability.
- d. Potential to cope with stressful situations and undertake responsibility.
- e. Trust worthiness and reliability.
- f. To understand and communicate intelligibly with patients and others.
- g. To behave in a manner that establishes professional relationships with patients and colleagues.
- h. Ability to work in a team.
- i. A critical enquiring approach to the acquisition of knowledge.

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

**2. Acquisition of Knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a. **Journal Review Meeting (Journal Club).** The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)
- b. **Seminars / Symposia.** The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)
- c. **Clinico-pathological conferences.** This should be a multidisciplinary study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.
- d. **Medical Audit.** Periodic morbidity and mortality meeting shall be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

### **3. Clinical skills:**

- a. **Day to Day work:** Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).
- b. **Clinical meetings:** Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).
- c. **Clinical and Procedural skills:** The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

**4. Teaching skills:** Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

**5. Periodic tests:** In case of degree courses of three years duration, the department may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. In case of diploma courses of two

year duration, the departments may conduct two tests. One of them at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.

**6. Work diary:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

**7. Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

**8. Log book:** The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate. Format for the log book for the different activities is given in Tables 1, 2 and 3 of Chapter IV. Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set him or herself right.

**CHAPTER IV (Contd)**  
**Format of Model Check Lists**

**Check List-I**

**MODEL CHECK-LIST FOR EVALUATION OF  
JOURNAL REVIEW PRESENTATIONS**

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

<b>Sl No</b>	<b>Items for observation during presentation</b>	<b>Poor 0</b>	<b>Below Average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very Good 4</b>
1.	Article chosen was					
2.	Extent of understanding of scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio-visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
	<b>Total Score</b>					

## Check List – II

### MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

SI No	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of Preparation					
4.	Clarity of Presentation					
5.	Understanding of subject					
6.	Ability to answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio-Visual aids					
9.	Overall Performance					
10.	Any other observation					
	<b>Total Score</b>					

### Check List - III

#### MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN WARD / OPD

(To be completed once a month by respective Unit Heads, including posting in other departments)

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

SI No	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations work up					
7.	Beside manners					
8.	Rapport with patients					
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.					
10.	Overall quality of ward work					
	<b>Total Score</b>					

### Check List - IV

#### EVALUATION FORM FOR CLINICAL PRESENTATION

**Name of the Student:**

**Name of the Faculty:**

**Date:**

SI No	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Completeness of history					
2.	Whether all relevant points elicited					
3.	Clarity of Presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs elicited correctly					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis: Whether it follows logically from history and findings					
10.	Investigations required <ul style="list-style-type: none"> <li>▪ Complete list</li> <li>▪ Relevant order</li> <li>▪ Interpretation of investigations</li> </ul>					
11.	Ability to react to questioning Whether it follows logically from history and findings					
12.	Ability to defend diagnosis					
13.	Ability to justify differential diagnosis					
14.	Others					
	<b>Total Score</b>					

### Check List - V

#### MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

SI No		Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses AV aids appropriately		



## Check List - VI

### MODEL CHECK LIST FOR DISSERTATION PRESENTATION

**Name of the Student:**

**Name of the Faculty:**

**Date:**

<b>Sl No</b>	<b>Points to be considered</b> <b>divine</b>	<b>Poor</b> <b>0</b>	<b>Below</b> <b>Average</b> <b>1</b>	<b>Average</b> <b>2</b>	<b>Good</b> <b>3</b>	<b>Very</b> <b>Good</b> <b>4</b>
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	<b>Total Score</b>					

**Check List - VII**

**CONTINUOUS EVALUATION OF DISSERTATION  
WORK BY GUIDE / CO GUIDE**

**Name of the Student:**

**Name of the Faculty:**

**Date:**

<b>Sl No</b>	<b>Items for observation during presentations</b>	<b>Poor 0</b>	<b>Below Average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very Good 4</b>
1.	Periodic consultation with guide/co-guide					
2.	Regular collection of case Material					
3.	Depth of analysis / discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	<b>Total Score</b>					





## LOG BOOK

**Table 2:** Diagnostic and Operative procedures performed

Name:

Admission year:

College:

<b>Date</b>	<b>Name</b>	<b>ID No.</b>	<b>Procedure</b>	<b>Category O, A, PA, PI*</b>

**\* Key:**

O - Washed up and observed

A - Assisted a more senior Surgeon

PA - Performed procedure under the direct supervision of a senior Surgeon

PI - Performed independently

**Model Overall Assessment Sheet**

**Academic Fear:**

**Name of the College:**

SI No	Faculty Member & Others	Name of Student and Mean Score																		
		A	B	C	D	E	F	G	H	I	J									
1.																				
2.																				
3.																				
4.																				
5.																				
	<b>Total Score</b>																			

## Chapter V

### Medical Ethics

#### Sensitisation and Practice

##### Introduction

There is now a shift from the traditional individual patient- doctor relationship and medical care. With the advances in science and technology and the needs of patients, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal and General Objective stated in Chapter II and develop human values it is urged that **ethical sensitisation** be achieved by lectures or discussion on ethical issues, clinical discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

##### Course Contents

###### 1. Introduction to Medical Ethics

- What is Ethics?
- What are values and norms?
- Relationship between being ethical and human fulfillment.
- How to form a value system in one's personal and professional life.
- Heteronomous Ethics and Autonomous Ethics.
- Freedom and personal Responsibility.

###### 2. Definition of Medical Ethics

- Difference between medical ethics and bio-ethics
- Major Principles of Medical Ethics
  - Beneficence = fraternity
  - Justice = equality
  - Self determination (autonomy) = liberty

###### 3. Perspective of Medical Ethics

- The Hippocratic Oath.
- The Declaration of Helsinki.
- The WHO Declaration of Geneva.
- International code of Medical Ethics. (1993)
- Medical Council of India Code of Ethics.

#### **4. Ethics of the Individual**

- The patient as a person.
- The Right to be respected.
- Truth and Confidentiality.
- The autonomy of decision.
- The concept of disease, health and healing.
- The Right to health.
- Ethics of Behaviour modification.
- The Physician – Patient relationship.
- Organ donation.

#### **5. The Ethics of Human life**

- What is human life?
- Criteria for distinguishing the human and the non-human.
- Reasons for respecting human life.
- The beginning of human life.
- Conception, contraception.
- Abortion.
- Prenatal sex-determination.
- In vitro fertilization (IVF).
- Artificial Insemination by Husband (AIH).
- Artificial Insemination by Donor (AID).
- Surrogate motherhood.
- Semen Intra-fallopian Transfer (SIFT).
- Gamete Intra-fallopian Transfer (GIFT).
- Zygote Intra-fallopian Transfer (ZIFT).
- Genetic Engineering.

#### **6. The Family and Society in Medical Ethics**

- The Ethics of human sexuality.
- Family Planning perspectives.
- Prolongation of life.
- Advanced life directives – The Living Will
- Euthanasia
- Cancer and Terminal Care

#### **7. Profession Ethics**

- Code of conduct.
- Contract and confidentiality.
- Charging of fees, Fee-splitting.
- Prescription of drugs.
- Over-investigating the patient.



- Low – Cost drugs, vitamins and tonics.
- Allocation of resources in health care.
- Malpractice and Negligence.

## **8. Research Ethics**

- Animal and experimental research / humaneness.
- Human experimentation.
- Human volunteer research — Informed Consent Drug trials.

## **9. Ethical workshop of cases**

- Gathering all scientific factors.
- Gathering all human factors.
- Gathering all value factors.
- Identifying areas of value — conflict, setting of priorities
- Working out criteria towards decisions.

## **Recommended Reading**

1. Francis C.M., Medical Ethics, 1 Ed, 1993, Jaypee Brothers, New Delhi, p 189, Rs. 150/-
2. Good Clinical Practices : GOI Guidelines for clinical trials on Pharmaceutical Products in India ([www.cdsco.nic.in](http://www.cdsco.nic.in))
3. INSA Guidelines for care and use of Animals in Research – 2000.
4. CPCSEA Guidelines 2001 ([www.cpcsea.org](http://www.cpcsea.org).)
5. Ethical Guidelines for Biomedical Research on Human Subjects, 2000, ICMR, New Delhi.
6. ICMR Guidelines on animal use 2001, ICMR, New Delhi.