THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.
POST GRADUATE DEGREE COURSES

SYLLABUS AND CURRICULUM

2021 - 2022

M.S. OPHTHALMOLOGY

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

M.S OPHTHALMOLOGY

STATEMENT OF THE COMPETENCIES

Keeping in view the general objectives of postgraduate training, each disciplines 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 PG CURRICULUM

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in Quality management systems and safety
- Training in communication skills, Ethics, Empathy, compassion
- Training in research methodology and thesis writing
- Training in outreach work in the community

1. GOALS

The goal of postgraduate medical education in ophthalmology shall be to produce competentspecialist

1. who shall recognize the Eye health needs of the community, and carry out professional obligations ethically, compassionately and in keeping with the objectives of the national health policy;
2. who shall have mastered all of the competencies, pertaining to the Ophthalmology ,that are required to be practiced at primary, secondary levels and most of the tertiary level care of the health care delivery system:
3. who understand quality management systems and are equipped with methods to keep themselves updated in future
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.

2. OBJECTIVES:

At the end of the postgraduate training the concerned the student should have thefollowing Knowledge, Attitudes and Skills and shall be able to:

1. Recognise the importance of Ophthalmology in the context of the health need of the community and the national priorities in the health sector.
2. Practice Ophthalmology ethically and compassionately.
3. Demonstrate sufficient understanding of the basic sciences relevant to research and practice of Ophthalmology.
4. Diagnose diseases by mastering skills to pick up clinical signs and interpreting test results towards this.
5. Have sound theoretical and practical knowledge to manage illness both medically and where relevant surgically based on principles of Evidence Based Medicine (EBM).
6. Have insight into ones limitations and refer to other centre/colleague for appropriate care of the illness being managed.
7. 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 promotive measures/strategies.
8. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
9. Demonstrate skills in documentation of individual case details as well as record morbidity and mortality data relevant to the assigned situation.
10. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

11. Play the assigned role in the implementation of national health programmes in Ophthalmology, effectively and responsibly.
12. Organise and supervise delivery of Ophthalmic care in the clinic/hospital or the field situation.
13. Develop skills as a self-directed learner, recognise continuing educational needs; select and use appropriate learning resources.
14. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
15. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
16. Function as an effective leader of a health team engaged in health care, research or training.

3. COMPONENTS OF POST GRADUATE CURRICULUM

Essential theoretical knowledge

The student is trained to become a specialist who will treat all eye conditions at the primary and secondary level and many of the tertiary care problems, there his/her theoretical knowledge should be broad based and should encompass all of what is there in good multi- volume text book of Ophthalmology.

Essential diagnostic skills - instrumentation

This list is only illustrative and more clinical tests whose importance have not been recognized in the past or newly developed should be learned.

Ophthalmic examination:

- **External eye examination with torch and magnification**
- **Vision assessment and recording in Snellen's notation and LogMar**
    - **i. Pediatric visual assessment**

b. Refraction

- **i. Retinoscopy**
- **ii. Streak Retinoscopy**
- **iii. Use of trial set**
- **iv. Use of Jackson's cross-cylinder**
- **v. Subjective refinement of refraction**

- **Autorefractometry**
    - **i. Use of and interpretation of autorefractometer**

- **Slit Lamp Examination**
    i. **Diffuse examination**
    ii. **Focal examination**
    iii. **Retroillumination – direct & indirect**
    iv. **Sclerotic scatter**
    v. **Specular reflection**
    vi. **Staining modalities and interpretation**
    vii. **Van Herick method for angle assessment**

- **Slit Lamp Accessories**
    i. **Applanation Tonometry**
        1. **Goldman's applanation**

    ii. **Gonioscopy**
        1. **Single or two mirror**
        2. **Grading of the angle**
        3. **Testing for occludability**
        4. **Indentation gonioscopy**

    iii. **3- mirror examination of the fundus**

    iv. **78-D / 90-D / 60-D retinal examination**

    v. **Hruby lens examination**

    vi. **Optical pachymetry**

    vii. **Slit lamp photography**

- **Tonometry**
    i. **Digital tonometry**
    ii. **Applanation**
    iii. **Indentation (commonly Schiotz)**
    iv. **Electronic tonometry**
    v. **Non contact Tonometer**

- **Pupil examination**
    i. **Direct and Consensual**
    ii. **Relative afferent pupillary defect**

- **Assessment of epiphora**
    i. **Jone's dye test**
    ii. **Syringing – performance & interpretation**
    iii. **Dye disappearance test**

- **Dry eye evaluation**
    i. **Schirmer test**
    ii. **Rose Bengal / Lissamine green staining**
    iii. **Tear film breakup time**
    iv. **Tear meniscus evaluation**

- **Direct ophthalmoscopy**
    i. **Distant direct**
    ii. **Use of filters provided**

- **Indirect ophthalmoscopy**
    i. **Scleral depression**
    ii. **Fundus drawing capability**
    iii. **Use of filters provided**

- **Colour vision evaluation**
    i. **Ishihara pseudoisochromatic plates**
    ii. **Other tests like**
        1. **Farnsworth – Munsell 100 – hue or 15 – hue tests or**
        2. **Holmgren's wools**

- **Use of Amsler's charting**
    i. **Instructing in the use of and interpreting the chart.**

- **Corneal topography and corneal mapping**
- **Corneal thickness assessment**
- **Specular microscopy of the corneal endothelium**

- **Keratometry**
    i. **Performance & interpretation of keratometry**
    ii. **Diagnosis of situations such as keratoconus**
    iii. **Keratoscopy**

- **Diagnosis & assessment of Squint**
    i. **Hirschberg test**
    ii. **Ocular position and motility examination**
    iii. **Versions, ductions, and vergences**
    iv. **Convergence facility estimation**
    v. **Cover / Uncover / Alternate cover test**
    vi. **Use of prism bars or free prisms in assessment of squint**
    vii. **Use of synoptophore / major amblyoscope**
    viii. **Use of Bagolini's striated glasses / red filters / Maddox rod**
    ix. **Use of Worth's four dot test**
    x. **Use & interpretation of the Hess chart / Lees' screen**
    xi. **Performance & interpretation of diplopia charting**
    xii. **Diagnosis of amblyopia**
    xiii. **Examination for stereopsis**

- **Exophthalmometry**
    i. **Detection of early proptosis**
    ii. **Use of any exophthalmometer like Hertels or Luedde's**

- **Corneal ulcer investigation**
    i. **Taking a corneal scraping**
    ii. **Inoculation into media**
    iii. **Evaluation of Gram's stain**
    iv. **Evaluation of KOH preparation**

- **Use and evaluation of ophthalmic ultrasound**
    i. **A- scan ultrasound with biometry**
    ii. **B- scan ultrasound : performance & interpretation**

- **Interpretation of Optical coherence Tomography images of the eye**
-
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
    i. **Doing and evaluating stereoscopic fundus photographs**
    ii. **Performance of and interpretation of FFA**
    iii. **Performance of indirect fluorescein angioscopy**

- **Interpretation of perimetry**
    i. **Confrontation fields**
    ii. **Tangent screen**
    iii. **Static computerized perimetry**
        1. **Interpretation of commonly managed problems**

- **Interpretation of Electrophysiological studies like ERG, VEP and EOG**

- **Evaluation of donor eye at Eye Bank**

- **Radiology**
    i. **Interpretation of plain skull films**
        1. **PA-20 (Caldwell's view)**
        2. **PNS (Water's view)**
        3. **Lateral**
        4. **Optic canal views**
        5. **Localisation of intra ocular and intra orbital FBs**

    ii. **Interpretations of contrast studies**
        1. **Performance & interpretation of dacryocystograms**

    iii. **Interpretation of CT Scans & MRI Scans**
        1. **Orbital CT and MRI evaluation**
        2. **Brain CT interpretation**

Non Ophthalmic clinical examination:

General medical examination at the undergraduate level
With special emphasis on a good Neurological examination and Examination of thesinus, Anterior nose and mouth

Essential Research Skills leading to writing of a thesis

1. Basic knowledge in epidemiology and biostatistics
2. Ability to undertake clinical or basic research by formulating a research question, Reviewing the literature, designing the appropriate study methodology, identifying the null hypothesis, Writing up a research proposal, Getting IRB approval, Collecting data, Collating and analyzing the results and writing up the research work as a thesis and for scientific publication. (Follow university standards for thesis writing)
3. Ability to constructively criticize published articles.
4. This could be achieved during the course by attending workshops on Research Methodology and statistics, Good clinical practice (GCP) ; Going through the process of doing the thesis with the help of a guide, basic and regularly having Journal Clubs in the department.
5. Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Attitudes including Communication skills:
Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

Training in research methodology, medical ethics, bioethics and medicolegal aspects

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, Bioethics, moral and legal issues and medical audit are partand parcel of the curriculum and syllabus.

Other skills required

1. Contact lenses
   - **a.** Pre fitting assessment
   - **b.** RGP and soft lens fitting
   - **c.** Special lens fitting eg keratoconus
   - **d.** Troubleshooting

2. Low vision assessment (LVA)
    a. The basics of LVA assessment and selection of aid with knowledge ofavailability & cost.

    b. Should have a basic knowledge of the facilities available for the blind including government concessions, and life style supports. Student should be exposed to LVA clinic

    c. An exposure to Cerebral Visual insufficiency evaluation as part of pediatric ophthalmology posting is desirable.

3. 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- Student should be exposed to the activities of the outreach service division.

4. Presentation skills
    a. Should part take in seminar presentation in the department .
    b. Should make presentations in conferences and CME programmes. Eg: Freepaper sessions or posters.

5. 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. Help organize exams in the department for various courses.

6. Communication skills
    a. With patients and colleagues
    b. Should read books on clinical communication skills and attend training programmes if available.

7. Record keeping and Quality
    a. Ability to maintain records as scientifically as possible
    b. Knowledge of computer software especially Excel and a statistical package.This is best learnt while doing the thesis.
    c. Should know the components of quality management systems and be ableto do clinical audits

8. Teaching
    a. The ability to pass on skills acquired to one's juniors, theoretical, proceduraland surgical

4. THEORY SYLLABUS :

a. The Basic Sciences :

i. Orbital and Ocular anatomy
   a. Gross anatomy
   b. Histology

ii. Ocular Physiology

iii. Pathology
   a. General pathology
   b. Ocular pathology : Gross pathology, Histopathology.

iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.

1. Microbiology
   a. General Microbiology
   b. Specific microbiology applicable to the eye
   c. Immunology with particular reference to ocular immunology

b. Optics and Refraction
   a. Physical optics
   b. Geometric optics
   c. Visual optics
   d. Applied optics including optical devices and contact lenses

c. Clinical Ophthalmology
   i. Disorders of Refraction
   v. Disorders of the Lids
   vi. Disorders of the Lacrimal System
   vii. Disorders of the Conjunctiva
   viii. Disorders of the Sclera
   ix. Disorders of the Cornea
   x. Disorders of the Uveal Tract
   xi. Disorders of the Lens
   xii. Disorders of the Retina
   xiii. Disorders of the Optic Nerve & Visual Pathway
   xiv. Disorders of the Orbit
   xv. Glaucoma
   xvi. Neuro ophthalmology
   xvii. Paediatric ophthalmology
   xviii. Systemic ophthalmology (Ocular involvement in systemic disease)
   xix. Immune ocular disorders
   xx. Strabismus & Ocular motility disorders

d. Community Ophthalmology

1. Understanding of Ophthalmic disease burden in the community
2. Community based eye care delivery
3. Community based rehabilitation
4. Community based eye research
5. World and National health programmes
6. Basics of epidemiology and biostatistics

5.TEACHING LEARNING METHODS:

Postgraduate training follows adult teaching principles. The faculties are supervisors cumfacilitator and not passive transmitters of knowledge.

1. Outpatient training

Students will see out patients (OP) in the clinic initially with the consultant; progressing to independently seeing patients and then discussing with faculty and finally seeing patients independently and treating patients. The faculty will be there in the OP to clear doubts at any stage.

2. Inpatient training

Students will work up the more difficult and surgical patients admitted to the ward and be responsible for their care under the faculty in charge of the wards. The cases in the wards will be discussed during rounds so that students gain practical experience.

3. Surgical training:

This will be graded. The student will first train in the wet lab and get used to handling the microscope and micro-instruments. They will also do minor procedures in the treatment room under supervision. Once wet lab training is over they will go to the operation theatre (OT) and in a graded manner first observing, then assisting, performing surgeries under supervision and finally doing independently and training juniors.

4. Emergency training:

Students will take on calls and attend emergencies and ward calls in a graded basis starting with being first on call. They will also assist and do emergency surgeries while being on call. While on call they will learn how to harvest donated eyes and see inpatients of other department requiring eye consultations. All students will have to attend Basic life support training.

5. Clinical Case discussions

a) Every effort should be made to include as wide a variety of cases as possibleover two years with multiple repetitions.

b) Case discussions will be a constant feature of round where patient's recordswritten by the student and treatment options will be discussed. Examination methods, evidence based management, latest developments etc. can also bediscussed.

c) Case presentation at other, in-hospital multidisciplinary forum may be done.

6. Seminars

a) Seminars should be conducted at least once weekly.

b) Seminars could be individual presentations or a continuum (large topic) with many candidates participating.

7. 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.

8. CPC

The students should attend Clinico Pathological Conferences (CPCs).

9. Lectures

a) Lectures to candidates should be in the form of instructional courses at the beginning of the academic term should be given so that students get a broad idea about the speciality.. 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.

10. Research Activities leading to Thesis

A candidate should learn to be conversant with journal browsing, medline search etc. to help in clinical and research work. They should also be given opportunity to attend research methodology classes. They should be involved in departmental research activities other than their thesis so that they can present in national conferences. Dissertation should be the main topic of research for the candidate. This should be a prospective study following all steps of research mentioned elsewhere in this document.

11. 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 classes should be taken during his / her course.

12. 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.

6. STRUCTURED TRAINING PROGRAMME:

Rotation and Posting in other Departments

The candidates should be rotated through the different units of the department to get an insight into different modes of functioning and the sub-specialities the units may be focusing on. In institutions where in depth subspecialties is not usually performed, (eg. VR surgery, orbit surgery etc.), students could be deputed for a month to institutions in which these specialities are highly developed.
For an MS student, optional postings to allied departments would includePlastic

Surgery – 1 week
Neurology / Neurosurgery – 1 week
ENT – 2 weeks
General Surgery – 1 week
General Casualty – 1 week

However, posting to these allied specialities would depend upon the head of department's discretion. The total duration of posting should not exceed 3 months.

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

Year – wise structured training schedule

First year:

1. **Theoretical knowledge**

    a. Basic sciences text books should have been read during this period. Optics and refraction book and a medium sized Single volume clinical Ophthalmology test should be read (Books from 1 to 9 in the text book list).

    b. It is useful to have an internal examination of the basic sciences at the endof the first year, which will decide appearance at the final examination.

    c. Clinical ophthalmology.

2. **Clinical examination and diagnostics**

    a. The art of history taking and all clinical examination skills should be learnt. The order of examination and recording should also be learnt during this time.

    b. By third month students should see outpatient cases independently and under supervision be encouraged to make clinical and surgical decisions.

    c. The art of retinoscopy and subjective refraction should be learnt.

3. **Diagnostics**

    a. Should have an exposure to all the equipments with the students themselves taking the test and then doing the tests themselves under supervision of the technician in charge. They should start to learn to interpretthe tests.

4. **Surgery**

    a. Extra ocular surgery including

        i. Destructive procedures like evisceration must have been done with or without assistance

        ii. Local Anaesthesia (retrobulbar, facial and peribulbar blocksmastered)

        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 lampetc.

        viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures as an assistant.

ix. Cataract surgery :

1. Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
2. At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

5. **Special training courses** in Research methodology, Ethics, Good clinical practice, Basic life support, Quality management and clinical audits, communication skills etc should be undertaken.

Second year :

1. **Theoretical Knowledge** :
   a. Student should start reading a multi-volume text book and internalize the same.

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:
The student should be conversant and at ease with most of the diagnostic procedures. The basic interpretation of the investigations should be mastered.

4. Surgical skills

a. At the end of the second year , the student should 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 antiglaucoma 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 and 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 complete reading a multivolume text book and referring to speciality books when needed.

2. **Clinical examination and diagnostics**
   - **a.** Should be conversant with all aspects of clinical examination and decision making. Independent decision making and investigational and managementfreedom 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 orassistance.
   - **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 tothe 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 encouraged to attend regional workshops and conferences particularly those dealing with the latest development.

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. Parabulbar anaesthesia	-	-	-	-
iv. Facial blocks				
• **O'Brein**	**-**	**-**	**-**	**20**
• **Atkinson**	**-**	**-**	**-**	**5**
• **van Lint & modifications**	**-**	**-**	**-**	**5**
v. Frontal blocks	**-**	**-**	**-**	**2**
vi. Infra orbital blocks	**-**	**-**	**-**	**1**

vii.	**Blocks for sac surgery**	**-**	**-**	**-**	**5**
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**	**-**	**-**	**3**	**-**
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.**	**-**	**-**	**-**	**5**
ii.	Small incision ECCE with or without IOL implantation				5
iii.	Membranectomy				
iv.	**Secondary AC or PC IOL implantation**				
v.	Phacoemulsification				2

vi.	Intra capsular cataract extraction	□			
vii.	**Vectis extraction**		-	1	-
h.	**Retinal surgery**				
i.	Needs to know how to assist in external 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 biopsyof orbital disease	□	-	-	-
(if experienced pathologist is available)					
j.	**Vitrectomy**				
i.	**Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitismanagement.**	**-**	**-**	**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

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 foreignbody 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 = Watched and Observed
A = Assisted the operating surgeon
PA = Performed with Assistance
PI = Performed Independently

7. Evaluation of the candidates in both theory and practical aspects will help thecandidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT:

- OVERALL:

a) Communication / commitment / Contribution / Compassion towards patients and Innovation () () - 5 Marks

b) Implementation of newly learnt techniques/skills () ()

- Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
- Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
- No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per Medical Council of India Post Graduate Medical Education Regulations 2000 (amended upto 10th August 2016)clause 13.9 A Postgraduate student of a Postgraduate degree Course in broad specialties/Super Specialties would be required to present one poster presentation to read one paper at a National/State conference and to present one Research paper which should be published/accepted for publication/sent for publication during the period of his Postgraduate studies so as to make him eligible to appear at the Postgraduate Degree Examination.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

10. Theory Examination:

Paper I: Basic Sciences related to Ophthalmology, Refraction & Optics

Paper II: Clinical Ophthalmology

Paper III: Systemic Diseases in Relation to Ophthalmology

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

Question paper pattern:

Paper I : Write notes on

i.	Anatomy	4 x 5 = 20
ii.	Physiology	4 x 5 = 20
iii.	Biochemistry	3 x 5 = 15
iv.	Pharmacology	3 x 5 = 15
v.	Pathology	3 x 5 = 15
vi.	Microbiology	3 x 5 = 15
	Total =	**100marks**

Paper II, III & IV :

i.	Elaborate on :	2 x 15 = 30
ii.	Write notes on	10 x 7 = 70
	Total =	**100marks**

11.Practical Examination:

CLINICALS	
LONG CASE – (1 X 80 MARKS)	80 MARKS
SHORT CASE – (2 X 30 MARKS EACH)	60 MARKS
FUNDUS (2 X 30 MARKS)	60 MARKS
REFRACTION (1 X 30 MARKS)	30 MARKS
WARD ROUNDS (5 CASES X 6 MARKS EACH)	30 MARKS
OSCE STATIONS (5 CASES X 4 MARKS EACH)	20 MARKS
DISSERTATION / THESIS	20 MARKS
CLINICAL TOTAL (Including Dissertation / Thesis)	300 MARKS (A)
VIVA VOCE	
VIVA	80 MARKS
LOG BOOK	20 MARKS
VIVA TOTAL	100 MARKS (B)
AGGREGATE (CLINICAL + VIVA) TOTAL	400 MARKS (A+B)
MINIMUM REQUIRED FOR PASS (50%)	200 MARKS

12. LOG BOOK:

The Post Graduates students shall maintain a record (Log) book of the work carriedout by them and the training Programme undergone during the period of training.

The record (log) book shall be checked and assessed periodically by the facultymembers imparting the training.

Periodic review of Log book and Dissertation have to be done in the Department byguide/HOD once in every 6 months

13. VIVA:

VIVA including Competency Assessment - 80 Marks (60 + 20)

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 60 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 including all investigations reports

14. OSCE:

Objective structured clinical exams are clinical pictures or cases with a structured set ofquestions & answers.

l Observation station (e.g)
Schiotz Tonometry
Observer to note

a. Whether patient's consent sought
b. Whether patient is properly instructed
c. Whether Tonometer is checked
d. Whether Topical drops applied
e. Way of handling
f. Whether the chart is referred

II Microbiology slide

a. Identification

b. Points for identification

c. A clinical Question relevant to the organismci.

III Pathology Slide

a. Identification

b. Points for identification
A clinical Question relevant to the slide

IV Anterior segment picture

a. Identification

b. Points for identification

c. A clinical Question relevant to the Pictureci.

V Posterior segment picture
. a. Identification
b. Points for identification
c. A clinical Question relevant to the Picture

15. Recommended basic reading Text books:

1. Anatomy:
    a. Wolff
    b. Snell's
2. Physiology:
    a. Adler's Physiology of the Eye
3. Immunology:
    a. Ocular immunology
4. Ophthalmic Pathology:
    a. Yanoff & Fine
    b. Zimmerman
5. Pharmacology:
    a. Havener
6. Refraction:
    a. Duke Elder's practice of refraction
    b. Elkington &Frank
7. Jack Kanski: Clinical Ophthalmology
8. Parson's text book of Ophthalmology
9. Stallard's Eye Surgery

10. Cataract Surgery & its Complications by Jaffe
11. Duane's System of Ophthalmology
12. Jakobiec Series
13. Peyman's Series
14. Cataract Surgery & its Complications by Jaffe
15. Duke-Elder's System of Ophthalmology
16. Podos & Yanoff Series

Reference book:

1. American Academy of Ophthalmology series BCSC latest edition released – this anupdate (not textbook) for specialists who have passed their qualification exams

2. Cornea :
    a. Smolin & Thoft
    b. Grayson
    c. Kaufman & Leibowitz

3. 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

4. Retinal disease:
    a. Stephen Ryan's Retina
    b. Ron Michel: Retinal Detachment
    c. Steve Charles: Basic Vitrectomy

5. Ultra Sound:
    a. Sandra Byrne & Ronald Green: Ophthalmic Ultrasound

6. Uvea:
    a. Nussenblatt & Palestine
    b. Smith & Nozik

7. Neuroophthalmology:
    a. Walsh & Hoyt

8. Orbital diseases:
    a. Rootman's diseases of the orbit
    b. Jakobiec & Snow – Diseases of the orbit

9. Tumours:
    a. Jerry Shields – Diagnosis and management of orbital tumours

10. Strabismus:
    a. Gunter von Noorden
    b. Mein &Trimble
    c. Practical orthoptics in the treatment of squint-Keith Lyle

11. Paediatric ophthalmology
    a. Kenneth Wright

ADDITIONAL READING

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.

2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.

3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.

4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.

5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8

6. Kirkwood B R, Essentials of Medical Statistics , 1st Ed., Oxford: Blackwell Scientific Publications 1988.

7. Mahajan B K, Methods in Bio statistics for medical students, 5th Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.

8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.

9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983

10. Srinivasa D K etal, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.

**** Note : The editions are as applicable and the latest editionsshall be the part of the syllabi.**

16. **JOURNALS** The list is not exhaustive and is just a guide- Other books with similar standard can be used

1. British Journal of Ophthalmology
2. American Journal of Ophthalmology
3. Indian Journal of Ophthalmology
4. Eye Journal Ophthalmology
5. Survey of Ophthalmology
6. IOC
7. Archives of Ophthalmology
8. Ophthalmology

LOG BOOK

Table 1 : Academic activities attended

Name: Admission Year:

College:

Date	**Type of Activity** **Specify Seminar, Journal Club, Presentation,UG teaching**	**Particulars**

LOG BOOK

Table 2 : Academic presentations made by the student

Name: Admission Year:

College:

Date	Topic	Type of Presentation Specify Seminar, Journal Club, Presentation, UG teaching etc.

LOG BOOK

Table 3 : Diagnostic and Operative procedures performed

Name: Admission Year:

College:

Date	Name	ID No.	Procedure	Category O, A, PA, PI*

*** Key:** O - Washed up and observed
A - Assisted a more senior Surgeon
PA - Performed procedure under the direct supervision of a senior surgeonPI - performed independently

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