REGULATIONS AND CURRICULUM GOVERNING

MS OPHTHALMOLOGY PROGRAM

(2024-25)

Name of the Constituent Unit/Centre: Yenepoya Medical College



YENEPOYA

Deemed to be University

Deralakatte, Mangalore, Karnataka.

NOTIFICATION FROM THE UNIVERSITY

YENEPOYA
(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

NOTIFICATION – 34-ACM/2019 dtd. 20.02.2019

Sub:- Implementation of Competency Based Medical Education PG Curriculum

Ref. : Resolution of the Academic Council at its 34th Meeting held on 08.02.2019 vide Agenda 33

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The Academic Council at its 34th Meeting held on 08.02.2019 and subsequently the 45th meetings of Board of Management held on 09.02.2019 have accepted the proposal for implementation of Competency Based Medical Education (CBME) for the PG Curricula of the following programs as per the MCI Norms.

1. MD in Pathology
2. MD in General Medicine
3. MD in Anaesthesiology
4. MD in Paediatrics
5. MD in Respiratory Medicine
6. MD in Radio-diagnosis
7. MD in Anatomy
8. MD in Physiology
9. MD in Biochemistry
10. MD in Microbiology
11. MD in Pharmacology
12. MD in Forensic Medicine
13. MD in Psychiatry
14. MD in Dermatology
15. MD in Community Medicine
16. MS in General Surgery
17. MS in OBG
18. MS in Otorhinolaryngology
19. MS in Ophthalmology
20. MS in Orthopaedics

This revised curriculum shall come into effect from the academic year 2019-2020 onwards.

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Deemed to be University

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MS IN OPHTHALMOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of this programme is to standardize Ophthalmology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in post graduate and undergraduate teaching as well as result in creating competent ophthalmic surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The clinical post graduate training programmes are intended at developing in a student a blend of qualities that of a clinical specialist, a teacher and a researcher. These programmes are organized such that a post graduate student should possess the following qualities, knowledge and skills:

a. The student should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, of the factors which may disturb these mechanisms and the disorders of structure and function which may result thereafter.
b. The student should be able to practice and handle most day-to-day problems independently in ophthalmology. The student should recognize the

limitations of his/her own clinical knowledge and know when to seek further help.

c. The student should understand the effects of environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.
d. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.
e. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.
f. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.
g. The student should be familiar with the current developments in Ophthalmic Sciences.
h. The student should be able to plan educational programmes in Ophthalmology in association with senior colleagues and be familiar with the modern methods of teaching and evaluation.
i. The student should be able to identify a problem for research, plan a rational approach to its solution, execute it and critically evaluate his/her data in the light of existing knowledge.
j. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.
k. The student should have basic knowledge of medico-legal aspects of medicine.
l. The student should be familiar with patient counselling and proper consent taking.

SUBJECT SPECIFIC COMPETENCIES

A post graduate student upon successfully qualifying in the M.S. (Ophthalmology)

Examination should be able to:

a. 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 situations encountered at the level of health services.

b. Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his/her practice.
c. Be aware of her/his own limitations to the application of the specialty in situations, which warrant referral to more qualified centers or individuals.\
d. Apply research and epidemiological methods during his/her practice. The post graduate student should be able to present or publish work done by him/her.
e. Contribute as an individual/group towards the fulfilment of national objectives with regard to prevention of blindness.
f. 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.

At the end of the course, the student should have acquired knowledge in the following:

A. Cognitive domain

Basic Medical Sciences:

- Attain understanding of the structure and function of the eye and its parts in health and disease.
- Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body with influence or control on the structure and function of the eye.
- Attain understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

1. Clinical Ophthalmology:

Given adequate opportunity to work on the basis of graded responsibilities in outpatients, inpatient and operation theatres on a rational basis in the clinical sections from the day of entry to the completion of the training programme, the students should be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases presented.
- Acquire understanding of and develop inquisitiveness to investigate to establish cause and effect of the disease.
- To manage and treat all types of ophthalmic cases.
- To competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
- To competently handle all ophthalmic medical and surgical emergencies.
- To be familiar with micro-surgery and special surgical techniques.
- To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

2. Refraction:

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.
- Acquire basic knowledge of manufacture and fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

3. Ophthalmic super-specialties:

Given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology, if possible, the student should be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuro-ophthalmology and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) glaucoma, c) cornea, (d) retina, (e) pediatric ophthalmology, (f) oculoplasty, (g) uvea, and (I) genetic

problems in ophthalmology.

- To demonstrate understanding of the manufacture, and competence in prescription and dispensing of contact lenses and ocular prosthesis.

5. Ophthalmic pathological/microbiological/biochemical sciences

- Be able to interpret the diagnosis in correlation with the clinical data and routine materials received in such cases.

6. Community Ophthalmology

Eye camps may be conducted where the PG students are posted for imparting training to according to a set methodology. The community and school surveys may also be conducted by the post graduate students.

The post graduate students are given an opportunity to participate in surveys, eye camps. They should be able to guide rehabilitation workers in the organisation and training of the blinds in art of daily living and in the vocational training of the blind leading to gainful employment.

7. Research:

- Recognise a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach with appropriate controls with full awareness of the statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately and objectively record on systematic lines results and observation made.
- Analyze the data with the aid of an appropriate statistical analysis.
- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done.
- Write a thesis in accordance with the prescribed instructions.

- Write at least one scientific paper as expected of International Standards from the material of this thesis.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical

skills: Essential diagnostic skills:

I. Examination techniques along with interpretation

1. Slit lamp Examination

i. Diffuse examination
ii. Focal examination
iii. Retroillumination - directand indirect
iv. Sclerotic scatter
v. Specular reflection
vi. Staining modalities and interpretation

2. Fundus evaluation

i. Direct/Indirect ophthamoscopy
ii. Fundus drawing

iii. 3-mirror examination of the fundus
iv. 78-D/90-D/60-D examination
v. Amsler's charting

II. Basic investigations along with their interpretation

1. Tonometry

Tonometry - Applanation/Identation/Non-contact

2. Gonioscopy

Gonioscopy grading of the anterior chamber angle

3. Tear/ Lacrimal function tests

i. Staining- fluorescein and Rose Bengal
ii. Schirmer test/tear film break up time
iii. Syringing
iv. Dacrocystography

4. Corneal

i. Corneal scraping and cauterization
ii. Smear preparation and interpretation (Gram's stain /KOH)
iii. Media inoculation
iv. Keratometry - performance and interpretation
v. Pachymetry
vi. Corneal topography - if available

5. Colour Vision evaluation

i. Ishihara pseudoisochromatic plates
ii. Farnsworth Munsell, if available

6. Refraction

i. Retinoscopy- Streak/ Priestley Smith
ii. Use of Jackson's cross-cylinder
iii. Subjective and objective refraction
iv. Prescription of glasses
v. Auto refractometry

7. Diagnosis and assessment of Squint

i. Ocular position and motility examination
ii. Synoptophore usage
iii. Lees screen usage
iv. Diplopia charting
v. Assessment of strabismus - cover tests/prisms bars
vi. Amblyopia diagnosis and treatment
vii. Assessment of convergence, accommodation, stereopsis, suppression

8. Exophthalmometry

Usage of Hertel's exophthalmometer - proptosis measurement

9. Contact lenses

i. Fitting and assessment of RGP and soft lenses
ii. Subjective verification of over refraction
iii. Complications arising of contact lens use
iv. Educating the patient regarding CL usage and imparting relevant knowledge of the complications arising thereon

10. Low Vision Aids

i. Knowledge of basic optical devices available and relative advantages and disadvantages of each.
ii. The basics of fitting with knowledge of availability & cost

III. The post graduate must be well versed with the following investigative modalities although the student may or may not perform it individually. But, she/he should be able to interpret results of the following tests:

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view
   PNS (Water's view) / Optic canal views

Localisation of intra-ocular and intra-orbital FBs

Interpretations of -USG/ CT/ MRI Scans

6. OCT and UBM
7. ERG, EOG, and VEP, Orbscan, Specular Microscopy

IV. Minor surgical procedures – Must know and perform independently

- Conjunctival and corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anaesthesia
- Posterior Sub-Tenon's injections
- Artificial eye fitting

V. Surgical procedures

1. Must know and can perform independently a. Ocular anaesthesia:

- Retrobulbar anaesthesia
- Peribulbar anaesthesia
- Facial blocks- O'Brein / Atkinson/Van lint and modifications
- Frontal blocks
- Infra orbital blocks
- Blocks for sac surgery

2. Must be able to independently perform and deal with complications arising from the following surgeries:

- Lid Surgery
  i. Tarsorrhaphy
  ii. Ectropion and Entropion
  iii. Lid repair following trauma
  iv. Epilation
  v. Botox injections

- Destructive procedures
  i. Evisceration with or without implant
  ii. Enucleation with or without implant

- Sac surgery
  i. Dacryocystectomy
  ii. Dacryocystorhinostomy
  iii. Probing for congenital obstruction of nasolacrimal duct

- Strabismus surgery
  Recession and resection procedures on the horizontal recti.
- Orbit surgery
  Incision and drainage via anterior orbitotomy for abscess
- Cyclocryotherapy/Cyclophotocoagulation

3. PG Students should be well conversant with use of operating microscope and must be able to perform the surgeries listed below competently under the same:

- Cataract surgery
  i. Standard ECCE (extracapsular cataract extraction; first year) with or without IOL implantation
  ii. small incision ECCE with or without IOL implantation and/or Phacoemulsification with PC IOL implantation
  iii. Intracapsular cataract extraction (second year)
  iv. Cataract with Phacoemusification (third year)
  v. Secondary AC or PC IOL implantation

- Vitrectomy/Scleral buckling
  i. Intra-vitreal and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
  ii. Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
  iii. Assisting vitrectomy and scleral buckling procedures
- Ocular surface procedures
  i. Pterygium excision with modifications
  ii. Conjunctival cyst excision/foreign body removal
  iii. Corneal foreign body removal
  iv. Conjunctival flap/ peritomy
- Glaucoma

  Trabeculectomy including Augmented Trabeculectomy
- Corneal
  i. Repair of corneo - scleral perforations
  ii. Corneal suture removal
  iii. Application of glue and bandage contact lens

4. Should have performed/assisted the following microscopic surgeries
   i. Keratoplasty
   ii. Therapeutic and optical
   iii. Glaucoma surgery
   iv. Pharmacological modulation of Trabeculectomy
   v. Trabeculotomy
   vi. Goniotomy
   vii. Glaucoma valve implant surgery

5. Desirable to be able to perform following laser procedures
   i. Yag Capsulotomy
   ii. Laser iridotomy
   iii. Focal and panretinal photocoagulation

6. Should have assisted/knowledge of Keratorefractive procedures including Phakic IOLs, Femtosecond laser refractive surgeries – SMILE & FLACS

Operations:

The PG is provided with an opportunity to perform operations both extra-ocular and intra-ocular with the assistance of the senior post graduate students and/or under the direct supervision of a faculty member. The student is provided with an opportunity to learn special and complex operations by assisting the senior post graduate student or the faculty in operations of cases of the specialty and be responsible for the post- operative care of these cases.

In **first phase**, the post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks. In the **next phase**, the post graduate student assists the operating surgeon during the operations. In the **third phase**, the post graduate student operates independently assisted by senior post graduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

Syllabus

Course contents:

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

I. Basic Sciences:

1. Orbital and ocular anatomy
   i. Gross anatomy
   ii. Histology
   iii. Embryology
2. Ocular Physiology
3. Ocular Pathology
4. Ocular Biochemistry
   General biochemistry, biochemistry applicable to ocular function
5. Ocular Microbiology
   General Microbiology, specific microbiology applicable to the eye
6. Immunology with particular reference to ocular immunology
7. Genetics in ophthalmology including gene therapy and genetic counselling
8. Community Eye Health
9. Molecular biology –Proteomics

II. Optics

a. Basic physics of optics
b. Applied ophthalmic optics
c. Applied optics including optical devices d. Disorders of Refraction

III. Clinical Ophthalmology

i. Disorders of the lids
ii. Disorders of the lacrimal system
iii. Disorders of the Conjunctiva

iv. Disorders of the Sclera
v. Disorders of the Cornea
vi. Disorders of the Uveal Tract
vii. Disorders of the Lens
viii. Disorders of the Retina
ix. Disorders of the Optic Nerve and Visual Pathway
x. Disorders of the Orbit
xi. Glaucoma
xii. Neuro-ophthalmology
xiii. Paediatric ophthalmology
xiv. Ocular involvement in systemic disease
xv. Immune ocular disorders
xvi. Strabismus and Amblyopia
xvii. Ocular oncology
xviii. Stem cell therapy

TEACHING AND LEARNING METHODS

Teaching Methodology:

The theoretical knowledge is imparted to the post graduate student through distinct courses of lecture demonstrations, seminars, symposia and inter- and intra-departmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia.

The post graduate students are imparted clinical training in several ways:

1. Group Discussion

The junior post graduate students may present the symposium to their senior postgraduates where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists. A free and fair discussion is encouraged. These discussions enable the post graduate students to prepare for a general discussion in the class.

2. Clinical Case discussion

a. Bedside discussion on the rounds and outpatient teaching take their toll with

patient management. Therefore in addition to these, clinical case discussions should form part of a department's schedule at a fixed time every week. This could range from 1-2 hours and could be held at least once a week. The choice and manner of presentation and discussion varies widely and is left to the discretion of the department. Every effort should be made to include as wide a variety of cases as possible over three years with multiple repetitions. Problem oriented approach is better as it aids in decision making skills

b. In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.
c. Consultant case presentation is another approach which should be encouraged as it aids in solving complex problems and also is forum for discussion of interesting cases.
d. 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.
e. Case presentation at other in-hospital multidisciplinary forums.
f. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
g. Department should encourage e-learning activities.

3. Seminars

Seminars should be conducted at least once weekly. The duration should be at least one hour. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic) with many post graduate students participating.

4. Journal clubs

Journals are reviewed in particular covering all articles in that subject over a 6 months period and are discussed by the post graduate student under the following headings.

1) Aim 2) Methods 3) Observations

4) Discussions and 5) Conclusions

The post graduate student to whom the journal is allotted presents the journal summaries to the senior postgraduates. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms and evaluate the article in the light of known literature.

5. A postgraduate student of a postgraduate degree course in broad specialities/super specialities 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.

6. **Out-Patients:** For the first six months of the training programme, post graduate students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period the post graduate student may also be oriented to the common ophthalmic problems. After 6 months, the clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

7. **Wards:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates. The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

Relevance of beds and admissions in Ophthalmology has really gone down at present, as most of the surgical and special investigative procedures are being performed on out-patient basis. Most of the teaching has to be imparted in out-patients department and special Clinics.

8. Rotations: Specialty clinics

The student may rotate in the following subspecialty clinics:

i. Anterior segment and cataract
ii. Glaucoma
iii. Oculoplastics
iv. Paediatric ophthalmology and strabismus
v. Retina and Uvea
vi. Cornea, Contact lens and low vision
vii. Neuroophthalmology
viii. Refractive Clinic

9. Practicals in Ocular Histopathology

The post graduate students may be provided with fully stained slides of the ocular tissues along with relevant clinical data and discuss the diagnosis and differential diagnosis on the basis of the information provided

10. Attend accredited scientific meetings (CME, Symposia, and Conferences).

11. Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to ophthalmology practice are suggested.

13. Maintenance of **log book**: Log books shall be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

The details of Essential Surgical skills and proposed minimum number during the PG training is as follows

Essential Surgical skills

	Procedures	Nature of activity * & number			
		O	A	PA	PI
A	Operating theatre				
1	Anaesthesia				
	Peribulbar anaesthesia	-	-	20	20
	Sub-Tenon's anaesthesia		-	-	-
	Intra-cameral anesthesia				
	Facial blocks				
	O ' Brein	-	-	-	Theoretical knowledge
	Atkinson	-	-	-	
	Van Lint & modifications	-	-	-	
	Blocks for lacrimal sac surgery	-	-	-	5
2	Lid surgery :				
	Tarsorrhaphy	-	-	-	5
	Ectropion and entropion procedures	2	2	-	

	Ptosis surgery	2	2	-	-
	Lid repair following trauma	2	-	2	-
	Surgical excision lid for mass	2	-	2	-
	Epilation, electrolysis, cryotherapy etc.	-	-	-	10
3	Destructive procedures:				
	Evisceration with or without implant	-	-	-	1
	Enucleation with or without implant	-	-	-	5
	Modified enucleation procedures for intraocular tumours	1	-		-
4	Lacrimal Sac surgery				
	Dacrocystectomy	-	-	-	2
	Dacryocystorhinostomy	-	-	2	
	Probing for congenital obstruction of nasolacrimal duct	-	1	1	-
	Endonasal & endocanalicular laser DCRs	1			
	Other forms of lacrimal surgery like conjunctivo-rhinostomy, canaliculo-dacryocystorhinostomy	1			
5	Extraocular muscle surgery				
	Recession and resection procedures on the horizontal recti	-	2	-	-
	Procedures on vertical extraocular muscles		1		
6	Cataract surgery				
	Small incision ECCE with or without IOL		20	10	10

	implantation				
	Secondary AC or PC IOL implantation		5		
	Phacoemulsification	20	10		
	Phakic IOLs	2			
	Pediatric cataract surgeries	2			
7	Retinal surgery				
	Sclera buckling	-	1	-	-
	Prophylactic cryotherapy		1	-	-
8	Orbital surgery				
	Anterior orbitotomy for diagnostics and therapy	1	-	-	-
	Lateral orbitotomy for tumours	1	-	-	-
	Incision and drainage via anterior orbitotomy for abscess	1		-	-
	Exenteration	1	-	-	-
	Fine needle aspiration biopsy of orbital disease	1	-	-	-
	Maxillofacial surgeries with orbital involvement	1	-	-	-
9	Vitrectomy				
	Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management	5	5	5	3
	Open sky vitrectomy (anterior segment) as management of cataract surgery complication	-	-	-	2
	Vitrectomy	5	2		

10	Corneal surgeries				
	Penetrating keratoplasty (therapeutic, optical)	1	-		-
	Lamellar Keratoplasty (External posting E/P)	1	-	-	-
	Femtosecond laser refractive surgeries - SMILE E/P	1			
	FLECK E/P	1			
	Conductive Keratoplasty E/P	1			
	Use of tissue glues	1			
	Corneal cross linking E/P	1			
11	Glaucoma surgery				
	Trabeculectomy	5	3	-	
	Trabeculotomy	1			
	Augmented trabeculectomy	2	2		
	Cyclocryotherapy and other cyclo-destructive procedures	1	-	-	
12	Surface ocular procedures				
	Pterygium excision conjunctival autograft	-	-	-	5
	Biopsy of conjunctiva	-	-	3	
	Wide excision of ocular –surface tumors with reconstruction of ocular surface	1	1		
13	Oculoplasty and oculo-facial rejuvenation Botox injections (E/P)	2	-	-	

B.	OUTPATIENT :				
1	Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection,.etc.	-	-	-	10 each
2	Conjunctival and corneal foreign body removal on the slit lamp	-	-	-	10
3	Chalazion incision and curettage	-	-	-	10
4	Excision biopsy of small lid Tumors	-	-	2	-
5	Suture removal skin, Conjunctival, corneal, and corneoscleral	-	-	-	5
6	Subconjunctival injection	10	-	-	10
7	Posterior Sub – Tenon's injections	2	-	2	
8	Laser posterior capsulotomy	10	-	-	2
9	Laser iridotomy	5	-	-	2
10	Laser trabeculoplasty		-	-	-
11	Panretinal photocoagulation	20	-	-	-
12	Focal photocoagulation	10	-	-	-
13	Refractive laser surgeries (In external posting-LASIK)	5	-	-	-

*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

At the end of three year course, the post graduate should develop the following skills:

1. Ability to undertake clinical & basic research
2. Basic statistical knowledge
3. Descriptive and Inferential statistics
4. Ability to publish results of one's work
5. Ability to constructively evaluate scientific publications

6. Understanding of bioethical issues

External posting to other Institutions

To other institution for specialized procedure in Refractive surgery

ASSESSMENT

Monitoring of Teaching / Learning activities

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 helps students evaluate themselves. The monitoring should be done by the staff of the department based on participation of students in various teaching/learning activities based on well established criteria assessment may be done using checklists that assess various aspects.

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide / teaching faculty. Feedback from patients may also be used as an evaluation tool regarding communication skills.

Various feedback and evaluation methods used are:

1. Log book

The log book is a record of the important activities of the candidates during his training. 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 presentation and procedures carried out by the candidates.

The log book shall be record of Interesting OP and IP cases

Surgical procedures performed and assisted

i. Record of wet lab

ii. Record of outreach programmes

iii. Record of teaching programmes including UG classes

iv. Record of External postings

v. Record of Scientific presentations

vi. Synopsis of Dissertation

2. Portfolio with reflections

    a. Seminar

    b. Case presentation

c. Tutorials

d. Journal club

e. UG Theory class

f. Surgical procedure

g. Evaluation of ward work

h. Patient feedback

3. Student Feedback on course (as per IQAC)
4. Student feedback on teaching faculty(as per IQAC)

FORMATIVE ASSESSMENT, ie, during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and

teaching

4. Departmental and interdepartmental learning activity

5. External and Outreach Activities / CMEs

6. Skill based assessment in the form of OSCE and work place based assessment

The student to be assessed periodically as per categories listed in postgraduate student appraisal form **(Table I)**

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000.

The Post Graduate examination shall be in three parts:

1. **Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners. From regulations)

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in

'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of

3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers.

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

Practical Examination		
	Details	Total Marks
Long Case/Exercises	1X120	120
Short Case/Exercises	2X60	120
OSCE/OSPE	5 unmanned stations and two manned stations	40
Dissertation Viva	20	20
Subtotal of Clinical/Practical		300
Viva		
Viva Voce	100	100
Grand total		400

The suggested distribution of practical marks is as follows

Practical Marks

S.N	Case	Marks

	Long Case – 120 Marks	
1.	history taking,	20
2.	clinical examination findings	30
3.	clinical reasoning	30
4.	investigations	20
5.	treatment	20
	Short Case (Fundus) – 1 - 60 Marks	
1.	presentation	20
2.	clinical reasoning	20
3.	management	20
	Short Case – 2 - 60 Marks	
4.	presentation,	20
5.	clinical reasoning	20
6.	management	20
	Dissertation - 20 Evaluated by external examiner	
1.	Methodology	10
2.	Discussion	10
	Case	**240**
1.	OSCE	40
2.	Dissertation	20
	Grand Total	**300**

Viva Marks

S.N	Details	Marks
1.	Drugs	20
2.	Instruments	20
3.	Community / Theory viva	10
4.	Perimetry / Ultrasound	20
5.	OCT/FFA/ Orb Scan	20
6.	CT, MRI/ Specimen / Path. and micro slides	10
	Total	100

Final PG University Examination MD/MS/DM/M.Ch Courses

For all clinical and Prepara subjects

Distribution of marks for Theory Examination

Item	Marks
No of Theory Papers	4
Marks for each Theory paper	100
Total marks for Theory paper	400
Passing Minimum for Theory	200/400

	(40% minimum in each paper) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)

Distribution of marks for Practical examination - Clinical departments

UNIVERSITY PRACTICAL EXAMINATION: Total Marks: 400 marks

Practical Examination		
	Details	**Total Marks**
Long Case/Exercises	1X120	120
Short Case/Exercises	2X60	120
OSCE/OSPE	5 unmanned stations and two manned stations	40
Dissertation Viva	20	20
Subtotal of Clinical/Practical		**300**
Viva		
Viva Voce	100	100
Grand total		**400**

The pattern of question paper will be as follows

Type of Question	Marks allotted	Number of questions	Marks
Short essay	10	10	100
Total			100

The postgraduate student will be assessed in a structured format on various criteria including history taking, clinical examination, clinical reasoning, investigations and management.

Recommended Reading: Books (latest edition)

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science.

Albert DM.

2. Principles and Practice of Ophthalmology. Albert DM, Jakobiec. W B Saunders

3. Principles & Practice of Ophthalmology. Gholam A Paymen

4. The Current American Academy of Ophthalmology Basic and Clinical Science

Course (13 volumes)

5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.

6. Text book of Ophthalmology. Yanoff and Duker

7. Retina. Stephen J Ryan:

8. Ophthalmic Ultrasound: Sandra Byrne and Ronald Green.

9. Cornea: Fundamentals, Diagnosis, and Management. Krachmer JH, Mannis

MJ, Holland EJ. Mosby Elsevier.

10. Ophthalmology. Yanoff N, Duker JS. Mosby Elsevier.

11. Review of Ophthalmology. Friedman NJ, Kaiser PK, Trattler WB. Elseview

Saunders, Philadelphia.

12. Corneal Transplantation. Vajpayee RB. Jaypee Brothers Medical Publishers

(P) Ltd, New Delhi.

13. Fundamentals of Clinical Ophthalmology Series. Coster D. Cornea. Blackwell

Publishing Limited.

14. The Contact Lens Manual. A practical guide to fitting. Gasson A, Morris A J.

Butterworth Heinemann Elsevier.

15. Steinert's cataract surgery.

16. Shields Text book of glaucoma

17. Smith and Nozik : Uvea

18. Rootman's diseases of the orbit

19. Eyelid, conjunctival and orbital tumors. An atlas and textbook. Shields JA, Shields CL. Philadelphia: Lippincott Williams & Wilkins.

20. Intraocular tumors. An atlas and textbook. Shields JA, Shields CL.

21. Pediatric Ophthalmology. Taylor and Hoyt: Saunders Ltd.

22. Management of Strabismus and Amblyopia. Pratt-Johnson and Tilson: Thieme Verlag.

23. Handbook of Pediatric Eye and Systemic disease. Wright, Spiegel and Thompson.

24. BinocularVision and Ocular Motility. Theory and Management of Strabismus. Von Noorden GK. Mosby.

25. Surgical Management of Strabismus. Helveston:

26. Strabismus: A Decision Making Approach. Von Noorden and Helveston:

27. Thyroid Eye Diseases. Char DR. Williams and Wilkins, Baltimore.

28. A Manual of Systematic Eyelid Surgery.Collin JRO (ed). Churchill Livingstone, Edinburgh.

29. Refractive Surgery. Agarwal A, Agarwal A, Jacob Soosan. Jaypee.

30. LASIK Complications, Prevention and management. Gimbel HV, Penno EEA. Slack Inc.

31. Management of Complications of Refractive Surgery. Alio JL, Azar DT. Springer.

32. Quality of Vision: Essential Optics for the Cataract and Refractive Surgeon. Holladay JT. Slack Inc.

33. Ocular Pharmacology: Havener

34. Anatomy: Wolff 's Anatomy of the Eye and Orbit

35. Physiology: Adler's Physiology of the Eye

36. Textbook of Ophthalmology (2 volumes). Easty DL, Sparrow JM.Oxford

Oxford Medical Publications.

37. The Eye. Basic Sciences in Practice. Forrester JV, Dick AD, McMenamin PG, Lee WR. W B Saunders.

38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass

JDM.

39. Neuroophthalmology. Glaser JS. LipincottWilliams & Wilkins. .

40. Clinical Ophthalmic Pathology. Harry J, Misson G. Butterworth/Heinemann.

41. Inherited Retinal Diseases. A Diagnostic Guide. Jimenez Sierra JM, Ogden TE, Van Boemel GB. Mosby.

42. Clinical Ophthalmology. Kanski JJ. Butterworth/Heinemann.

43. ABC of Resuscitation. Colquhoun, M. C., Evans, T. R., Handley, A. J. BMJ Publishing Group.

44. Walsh and Hoyt's Clinical Neuroophthalmology (5 volumes). Miller NR, Newman NJ, Williams and Wilkins.

45. The human eye. Oyster CW Sinauer Associates. Sunderland. Massachusetts

46. Paediatric Ophthalmology. Taylor D. Blackwell Science.

47. Decision Making in Ophthalmology. Van Heuven WAJ, Zwann J. Mosby.

48. Parsons' Diseases of the eye. Sihota and Tandon.

49. Wills Eye Manual

50. International Council of Ophthalmology Residency Curriculum available at http://www.icoph.org/

Journals

03-05 international Journals and 02 national (all indexed) journals

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DEPARTMENT OF OPHTHALMOLOGY
YENEPOYA MEDICAL COLLEGE
Blueprint for MS Ophthalmology theory question paper

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

S.N	Topic	Weightage	Marks allotted	No. of questions
1.	Ocular Anatomy /Embryology/ Histology	20%	20	02
2.	Ocular Physiology/ Biochemistry	20%	20	02
3.	Refraction/Optics of instruments	20%	20	02
4.	Ocular Microbiology/ Pathology/ Immunology/Genetics	20%	20	02
5.	Ocular Pharmacology	10%	10	01
6.	Miscellaneous – Imaging / AETCOM	10%	10	01
	Total	**100%**	**100**	**10**

Paper II: Clinical Ophthalmology

S.N	Topic	Weightage	Marks allotted	No. of questions
1.	Conjunctiva/ Ocular surface/ Cornea	10%	10	01
2.	Uvea/Sclera	10%	10	01
3.	Lens	10%	10	01
4.	Retina	10%	10	01
5.	Glaucoma	10%	10	01
6.	Neuro-Ophthalmology	10%	10	01
7.	Peadiatric Ophthalmology/Squint	10%	10	01
8.	Orbit / Oculoplasty /Lacrimal	10%	10	01

9.	Trauma	10%	10	01
10.	Miscellaneous - Ethical/ Medicolegal issues in clinical ophthalmology	10%	10	01
	Total	**100%**	**100**	**10**

Paper III: Systemic Diseases in Relation to Ophthalmology

S.N	Topic	Weightage	Marks allotted	No. of questions
1.	Uveitis with systemic associations (Connective tissue disorders - RA, SLE, GIA, PAN, Sjogren syndrome etc) Spondylo arthropathies - Ankylosing spondylitis, Reiters, Psoriatic etc) Marfans	20%	20	02
2.	Systemic infections & infestation (AIDS, TB, Syphilis, Leprosy, Toxoplasma, Toxocara, Rubella, Cysticercosis,Chlamydial, etc)	20%	20	02
3.	Non infectious multi system disease (Sarcoid, Behcet, VKH, etc)	10%	10	01
4.	Metabolic disease (DM, Thyroid, Homocystinuria, Cushings, etc)	10%	10	01
5.	Ocular manifestation of systemic malignancies	10%	10	01
6.	Ocular side effects of systemic drugs	10%	10	01
7.	Ocular manifestations of neurological/ Auto immune /Myopathy disorders	10%	10	01

	(MS, Phacomatosis, Myasthenia Gravis etc)			
8.	Miscellaneous Aging pregnancy Muco cutaneous disease / (Steven Johnson, TEN, Acne Rosacea, Phemphigoid, etc)	10%	10	01
	Total	**100%**	**100**	**10**

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

S.N	Topic	Weightage	Marks allotted	No. of questions
1.	Recent advances in the anterior segment	10%	10	01
2.	Recent advances in the posterior segment	10%	10	01
3.	Recent advances in surgical techniques	10%	10	01
4.	Recent advances in Pharmacology and drug delivery systems	10%	10	01
5.	Recent advances in Genetics and Immunology	10%	10	01
6.	Recent advances in Imaging system	10%	10	01
7.	Community Ophthal (Eye Banking /Eye Camps/ National programs, Low Vision)	30%	30	03
8.	Miscellaneous	10%	10	01
	Total	**100%**	**100**	**10**

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MODEL QUESTION PAPER

PAPER - I

Sub: Basic Sciences related to Ophthalmology, Refraction & Optics

Date: Time: 3 hours Max. Marks: 100

N.B:

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks
3) Draw neat labeled diagrams **WHEREVER** necessary

Long essays: **10X10 marks= 100 Marks**

1. Discuss the mechanisms of accommodation of the eye. Discuss various methods of assessment of the anomalies of accommodation. (5+5M)
2. Describe theories of colour vision, methods of detection of colour blindness and types of colour blindness (4+3+3)
3. Draw a cross-section labelled diagram of the lacrimal system and discuss the relationship of the orbicularis oculi muscle to the sac. Discuss the lacrimal pump mechanism.(4+3+3)
4. Draw a labelled diagram of the longitudinal section of the upper eyelid. Discuss the anatomy of levator palpebrae superioris (5+5)
5. Discuss the formation and outflow of aqueous humour with drugs acting on it. (10M) (4+4+2)
6. List the organisms responsible for keratitis.Discuss various stains and culture methods used in ophthalmic microbiology.(3+7 =10)
7. Describe pharmacological properties, mechanism of action and side effects of antiviral drugs used in ophthalmology.(4+3+3)
8. Describe briefly the embryological evolution of the anterior segment of the eye 10M

9. Describe the genetics and inheritance pattern of Retinitis Pigmentosa and Retinoblastoma(5+5)
10. Describe the histopathological features of squamous cell and basal cell carcinoma with the help of neat diagram(5+5)

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PAPER- II

Model Question Paper

Sub: Clinical Ophthalmology

Date: Time: 3 hours Max. Marks: 100

N.B:

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks
3) Draw neat labeled diagrams **WHEREVER** necessary

Long essays: **10X10 marks= 100 Marks**

1. Describe the clinical features and management of a case of bacterial keratitis.(5+5)
2. Discuss the approach to a case of granulomatous anterior uveitis.
3. Discuss the clinical features of congenital glaucoma and its surgical management (5+5)
4. Discuss the indications for vitrectomy in a case of diabetic retinopathy and briefly mention about vitreous substitute (5+5)
5. Discuss the etiopathogenesis and management of pigmentory glaucoma (5+5)
6. Discuss the differential diagnosis of unilateral disc edema in a 30 year old lady.
7. Classify esotropias. Discuss essential infantile esotropia in detail. (3+7)
8. Discuss the approach to a case of recent-onset unilateral proptosis in a 30-year-old woman.
9. Discuss the effects of blunt trauma on the posterior segment and a write a note on management of hyphema (6+4)
10. Discuss prevention of post-operative endophthalmitis. Add a note on the medicolegal aspects.(7+3)

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Paper III

Systemic Diseases in Relation to Ophthalmology

Date: Time: 3 hours Max. Marks: 100

N.B:

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks
3) Draw neat labelled diagrams **WHEREVER** necessary

Long essays: **10X10 marks= 100 Marks**

1. Describe the ocular findings of Sjögren's syndrome. How will you evaluate and manage the case? (5 +5)
2.
   a) A 30-year-old male presents with an acute unilateral red eye and pain. He has a history of chronic low backache and morning stiffness.Discuss the evaluation and management of this case(5)
   b) Outline the ocular manifestations of Marfan's syndrome. (5)
3. Describe the clinical features, investigations and management of ocular sarcoidosis. (3,3,4)
4. Discuss the ocular manifestations and diagnosis of tuberculosis. (6,4)
5. What are the ocular manifestations seen in HIV/AIDS patients? Discuss the diagnosis and management of CMV retinitis. (5,5)
6. Discuss clinical features, classifications and management of diabetic macular edema. (2,3,5)
7. List the systemic malignancies known to metastasise to the eye. Describe the typical ocular findings in choroidal metastasis. Outline diagnostic modalities and treatment options. (2,4,4)
8.
   a) What are the ocular manifestations and pathogenesis of hydroxychloroquine toxicity? How do you monitor patients on long-term hydroxychloroquine? (5)

b) Describe the fundus findings in radiation retinopathy (5)

9. Discuss the ocular manifestations and management of myasthenia gravis. (5+5)
10. A 34-year-old pregnant lady presents with sudden bilateral loss of vision. How will you evaluate and manage the case? (10)

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Paper IV
Model Question Paper
Sub: Recent Advances in Ophthalmology and Community Ophthalmology

Date: Time: 3 hours Max. Marks: 100

N.B:

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks
3) Draw neat labeled diagrams **WHEREVER** necessary

10X10 marks= 100 Marks

1. Describe the recent advances in the management of keratoconus 10M
2. Describe the role of artificial intelligence in diagnosing and managing ocular conditions 10M
3. Describe the recent advances in the management of dry eye disease 10M
4. Describe the functions of a) an eye bank b) district blindness society (5+5)
5. Describe the role of telemedicine in Ophthalmology. Write a short note on visual rehabilitation (5+5)
6. Describe the current modalities of treatment for myopia progression in children 10M
7. Describe the role of biologicals in ocular inflammatory conditions 10M
8. Describe the recent advances in the surgical management of glaucoma 10M
9. A) Role of gene therapy in Ophthalmology B) Femtosecond lasers in Ophthalmology (5+5)
10. Describe the recent surgical techniques for the management of macular hole 10M

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Table I

Postgraduate Students Appraisal Form
Department of Ophthalmology

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Date of Assessment :

Sr. No.	PARTICULARS	Not Satisfactor	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
		less than 50%	50 to 69 %	more than and equal to70%	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based	E			
3.	Self directed learning and				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications Yes/ No

Remarks* _____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

Signature of Assessee **Signature of Consultant** **Signature of HOD**

DEPARTMENT OF OPHTHALMOLOGY
FORMATIVE ASSESSMENT

Theory

- Monthly test

Clinical/Practical

- Skill
  - OSCE
  - DOPS
- Self directed learning and teaching
- Departmental and interdepartmental learning activity
- External and Outreach Activities / CMEs
- Dissertation review / Research work
- Log Book Maintenance – E portfolio