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NARAYAN MEDICAL COLLEGE & HOSPITAL

**GUIDELINES FOR COMPETENCY BASED
POSTGRADUATE TRAINING PROGRAMME FOR**

**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:

1. 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.
2. 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.
3. 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.
4. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.
5. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.
6. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.
7. The student should be familiar with the current developments in Ophthalmic Sciences.
8. 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.
9. 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.

10. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.
11. The student should have basic knowledge of medico-legal aspects of medicine.
12. The student should be familiar with patient counseling 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 fulfillment 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

1. 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.

2. 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.

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3. 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.

4. 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. PSYCHOMOTORDOMAIN

At the end of the course, the student should acquire following clinical skills:
Essential diagnostic skill

i. EXAMINATION TECHNIQUES ALONG WITH INTERPRETATION

1. Slit lamp Examination

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

2. Fundus evaluation

- Direct/Indirect ophthalmoscopy
- Fundus drawing
- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination
- Amsler's charting

ii. **BASIC INVESTIGATIONS ALONG WITH THEIR INTERPRETATION**

1. **Tonometry**

Tonometry - Applanation/Indentation/Non-contact

2. **Gonioscopy**

Gonioscopy grading of the anterior chamber angle

3. **Tear/ Lacrimal function tests**

- i. Staining- fluoresce in and Rose Bengal
- ii. Schirmer test/tear film break uptime
- iii. Syringing
- iv. Dacrocystography

4. **Corneal**

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain /KOH)
- Mediainoculation
- Keratometry - performance and interpretation
- Pachymetry
- Corneal topography – if available

5. **Colour Vision evaluation**

- Ishihara pseudoisochromatic plates
- 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

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**

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

10. **Low Vision Aids**

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- 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. Fluoresceinangiography
3. Ophthalmic ultrasound A-scan/Bscan
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

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, parabolbar 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-Tarsorrhaphy
Ectropion and entropion Lid repair following trauma Epilation
 - Destructive procedures
Evisceration with or without implant 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 (extra capsular 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. Intra capsular cataract extraction (second year)
 - iv. Cataract with Phacoemulsification (third year)
 - v. Secondary AC or PC IOL implantation
 - Vitrectomy/Scleral buckling
 - Intra-vitreous and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
 - Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
 - Assisting vitrectomy and scleral buckling procedures
 - Ocular surface procedures
 - Pterygium excision with modifications Conjunctival cyst excision/foreign body removal Corneal foreign body removal Conjunctival flap/ peritomy
 - Glaucoma
 - Trabeculectomy
 - Corneal
 - Repair of corneo - scleral perforations Corneal suture removal
 - Application of glue and bandage contact lens
4. Should have performed/assisted the following microscopic surgeries
- i. Keratoplasty Therapeutic and optical
 - ii. Glaucoma surgery
 - Pharmacological modulation of trabeculectomy
 - Trabeculotomy
 - Goniotomy
 - Glaucoma valve implant surgery
5. Desirable to be able to perform following laser procedures
- Yag Capsulotomy
 - Laser iridotomy
 - Focal and panretinal photocoagulation
6. Should have assisted/knowledge of Kerato refractive procedures

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
8. Community Eye Health

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

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 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.
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:

- Anterior segment and cataract
- Glaucoma
- Oculoplastics
- Paediatric ophthalmology and strabismus
- Retina and Uvea
- Cornea, Contact lens and low vision
- Neuro ophthalmology
- Refractive Clinic

9. Practical's 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, and 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.

ASSESSMENT

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.

FORMATIVE ASSESSMENT, ie., during the training

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 MD training should be based on:

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 /CME

Internal Assessment

The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student. Marks should be allotted out of 100 as followed.

S. No	Items	Marks
1	Personal Attributes	20
2	Clinical Work	20
3	Academic activities	20
4	End of term theory examination	20
5	End of term practical examination	20

1. Personal attributes:

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.

- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
 - **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
 - **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.
3. **Academic Activity:** Performance during presentation at Journal club/ Seminar/Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.
4. **End of term theory examination** conducted at end of 1st, 2nd year and after 2 years 9 months
5. **End of term practical/oral examinations** after 2 years 9 months.
- ◆ Marks for personal attributes and clinical work should be given annually by all the consultants under whom the resident was posted during the year. Average of the three years should be put as the final marks out of 20.
 - ◆ Marks for academic activity should be given by the all consultants who have attended the session presented by the resident.
 - ◆ The Internal assessment should be presented to the Board of examiners for due consideration at the time of Final Examinations.

SUMMATIVE ASSESSMENT, i.e., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

- Ratio of marks in theory and practical will be equal.
- The pass percentage will be 50%.
- Candidate will have to pass theory and practical examination separately

The examination shall be in three parts:

1. Thesis

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.

2. Theory Examination:

There shall be four papers each of three hours duration. These are:

Paper I	Basic Science related to Ophthalmology, Refraction & Optics	100 marks*
Paper II	Clinical Ophthalmology	100 marks*
Paper III	Systemic diseases in relation to Ophthalmology	100 marks*
Paper IV	Recent advances in Ophthalmology and Community Ophthalmology	100 marks*

***10 question carrying 10 marks each**

3. Clinical / Practical and viva-voce Examination

Practical examination should be taken to assess competence and skills of techniques and procedures and should consist of two long cases, two short cases and 10 spots.

1 Long cases	100 marks	100
2 Short cases	40 marks each	80
2 fundus cases	40 marks each	80
1 refraction case	40 marks	40
Total =		300

Oral/Viva voce Examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject and shall include:

Grand Viva	50 marks
Instruments	10 marks
Pathology specimen	10 marks
Drugs, X-rays, USG/OCT/CT/MRI scan	10 marks
Visual field and other ophthalmic diagnostic charts	10 marks
Log book	10 marks
Total	100 marks

RECOMMENDED READING:

BOOKS (LATEST EDITION)

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science. AlbertDM.
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 (13volumes)
5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.
6. Text book of Ophthalmology. Yan off 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. MosbyElsevier.
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. Binocular Vision 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, Mc Menamin PG, Lee WR. W B Saunders.
38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass JDM.
39. Neuroophthalmology. Glaser JS. Lippincott Williams & 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

SENT UP CRITERIA

- ◆ The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student. Marks should be allotted out of 100 as followed.

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2	Clinical Work	20
3	Academic activities	20
4	End of term theory examination	20
5	End of term practical examination	20

Note: MINIMUM 75% MARKS WILL BE COMPULSORY

- ◆ Postgraduate student appraisal form (Annexure I) duly signed by HOD of Department.

ANNEXURE I

Postgraduate Students Appraisal Form Pre /Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
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.	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 Assesses

Signature of Consultant

Signature of HOD



GOPAL NARAYAN SINGH UNIVERSITY
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