

NIMS UNIVERSITY, JAIPUR



SYLLABUS

DIPLOMA IN OPHTHALMIC TECHNOLOGY

Scheme of Examination

I Semester

S.No.	Subject	Theory	Practical
1	Anatomy and Physiology	100	100
2	Microbiology & Pharmacology	100	100
3	Optics	100	100

Semester I**Anatomy and Physiology****Unit I****Biology and Human Welfare : (2 lectures)**

- Infectious diseases : General Cases: Causes, control, immunity and chemotherapy.
- Diseases of man: Definition of diseases, different types of pathogens (bacteria, viruses and virus like organisms, fungi, helminthes, protozoa etc.) source of infection, infection and contagion, economic importance of diseases, methods of prevention and biological control.

Unit II**Anatomy and Physiology of the Human Body (14 lectures)**

- Cell structure and function
- Tissues : Epithelial, Muscular, Connective (cartilage and bone) and nervous
- Skeletal system
- Muscular system
- Blood
- Circulatory system
- Respiratory system
- Nervous system
- Endocrine system
- Urinary system
- Ear
- Skin
- Nose and Tongue

Unit III**Anatomy of the Eye and Orbit (15 lectures)**

- Orbit – its relations and vascular communications
- Eye lid and its glands
- Conjunctiva
- Lacrimal apparatus
- Extraocular muscles
- Cornea and Sclera
- Iris, Ciliary body and choroid
- Retina
- Lens and vitreous
- Optic Nerve and Visual Pathway

- Cranial nerves III, IV
- Cranial nerves V, VI, VII
- Para-sympathetic and sympathetic nerve in relation to the eye
- Pituitary gland and Cavernous sinus
- Embryology of the Eye

Unit IV

Physiology of the Eye (17 lectures)

- Vascular circulation of eye
- Aqueous humour
- Intra-ocular pressure
- Vitreous
- Cornea and Sclera
- Lens
- Retina
- Protective mechanism of eye (2lectures)
- Physiology of Vision (2lectures)
- Physiology of extraocular binocular vision
- Electroretinogram and adaptation
- Visual acuity and testing

Microbiology & Pharmacology

Unit I

Ocular Microbiology (6 lectures)

- Ocular Microbiology
- Bacteria
- Viruses
- Fungi
- Protozoa (Parasites)
- Sterilization

Unit II

Ocular Pharmacology (13 lectures)

- General aspects of Pharmacology (3 lectures)
- Anti microbials (3 lectures)
- Anti – inflammatory drugs (2 lectures)
- Autonomic drugs and anti-glaucoma agents (2 lectures)
- Drugs for dry eye and diagnostic agents
- Ocular anaesthetics
- Ophthalmic prescriptions

Optics

Unit I

Physical Optics

- Properties of Light
- Principles of reflection of Light
- Principles of refraction of Light
- Lenses and their combinations

Unit II

Physiological Optics

- Darkroom procedures
- Ophthalmoscopy
- Retinoscopy
- Subjective examination
- Errors of refraction
- Hypermetropia
- Myopia
- Astigmatism
- Refractive surgery
- Anisometropia and aniseikonia
- Accommodation
- Convergence

Unit III

Mechanical Optics and Workshop (14 lectures)

Mechanical Optics

- General power, shape and size of lenses
- Transposition of spectacle lenses
- Spherical lenses
- Cylindrical lenses
- Bifocals and multifocals
- Ophthalmic prisms
- Oblique cylinders
- Protective and plastic lenses
- Lens measure; GENEVA
- Focimeter
- Special lenses – miscellaneous lenses and appliances

Workshop

- Grinding machines
- Grinding material
- Tools and gauge and their testing

Semester II

S.No.	Subject	Theory	Practical
1	Instruments and Care	100	100
2	Orthooptics	100	100
3	Nutrition and Industrial Hazards	100	100

Semester II**Instruments and Care****Unit I****Practice as Eye Care Professional : (18 lectures)**

- Initial patient contact and reception and ethics
- Office manner, secretarial assistance, records and their retrieval
- Ophthalmic equipment
- Maintenance of Ophthalmic equipment
- Examination of the Eye
- Special investigations
- Routine ophthalmic investigation
- Conjunctival smear, fluorescein usage
- Colour vision

Unit II

- Visual fields
- Syringing and lacrimal function tests
- Refractometer and focimeter usage
- Tension taking
- Keratometry
- Pachometry
- Anaesthesiometry and dark adaptometry
- Exophthalmometry
- A scan and B scan

Orthoptics

Unit I

Orthoptics, Pleoptics and Muscular Imbalance (19 lectures)

- Normal binocular function, Grades of binocular vision, simultaneous perception, Fusion and Stereopsis
- Aetiology of strabismus-motor, central and sensory
- Methods of examination of strabismus, history, visual acuity and cover test
- (a) Ocular movements and their testing (b) Measurements of angle of squint
- © Testing of binocular functions, (d) Hyterophoria and Cyclophoria
- Esophoria : classification : investigation and therapy
- Exophoria : classification: investigation and therapy
- Hyperphoria and Cyclophoria
- Abnormalities and binocular vision – diplopic, confusion and suppression

Unit II

Abnormal retinal correspondence (1) Definition, aetiology and classification

Investigation and relative importance

- A.C./A Ratio : its importance in congenial squint, methods of testing
- Congenial squint (accommodative): Aetipathogenesis, classification and special investigations.
- Treatment of accommodative squint : Optical, Orthoptic, miotic, surgery
- Non accommodative squint : classification, investigation and treatment
- Divergent squint : Aetiology, classification, investigation, differential diagnosis of primary and secondary verical squints
- Alternating circumduction : Aetiology, classification, clinical picture, investigation and management
- Suppression : Detection and treatment
- Amblyopia : Definition, aetiology, development, classification, detection and management with occlusion therapy
- After image : definition, description, usage of after image
- Haidinger brushes : Theory, their usage in diagnosis and therapy
- Pleoptic therapy : Cupper's method, Bangerter's method
- Fixation anomalies

Unit III

- Indications of orthoptic and surgical treatment of strabismus
- Post operative orthoptic management
- Accommodation anomalies
- Convergence anomalies
- Nystagmus

Nutrition and Industrial Hazards

Unit I

Nutrition and Eye Diseases

- Nutrition deficiencies : Vitamins
- Nutrition deficiencies : Proteins, Fat, Carbohydrates and Minerals

Unit II

Industrial Hazards and their prevention

- Industrial injuries / accidents and foreign bodies
- A.U.V. Infra red and other radiation injuries, thermal injuries
- Intra-ocular pressure
- Vitreous
- Cornea and Sclera
- Lens
- Retina
- Protective mechanism of eye (2lectures)
- Physiology of Vision (2lectures)
- Physiology of extraocular binocular vision
- Electroretinogram and adaptation
- Visual acuity and testing

III Semester

S.No.	Subject	Theory	Practical
1	Common Eye Disease	200	200
2	Computer and Typing	100	100

Semester III**Unit I****Common Eye Diseases of**

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|-------------|-------------|--------------------|----------------|
| a. Eye lids | b. Orbit | c. Adnexad | d. Conjunctiva |
| e. Cornea | f. Selera | g. Uvea | h. Lens |
| i. Retina | j. Glaucoma | k. Injuries of eye | |

Unit II**Computers & Typing (10 lectures)**

- Introduction to computers
- Operating System
- Computer Hardware, input out put devices, peripherals
- Computer software
- MS Word
- MS Excel
- MS Power Point

Semester IV

S.No.	Subject	Theory	Practical
1	Sterilization of theatre and instruments	100	100
2	Operative Procedures	150	150
3	Community Ophthalmology	50	50

Sterilization of theatre and instruments

Unit I

Sterilization and theatre (6 lectures)

- General aspects
- Sterilization and disinfections
- Theatre set up
- Principles of sterilization – asepsis and antisepsis
- Eye instruments and operating room equipment
- Surgical scrub and donning sterile linen and gloves

Unit II

Pre and post operative methods (3 lectures)

- Preoperative preparation
- Post operative care, general considerations
- Surgical preparation and draping

Unit III

Outlines of operative procedures (10 lectures)

- Lids
- Lacrimal apparatus
- Extraocular muscles
- Cornea
- Glaucoma
- Eye Banking and enucleation
- Taruma
- Retina and Viterous
- Application of lasers

21.

Community Ophthalmology

Functioning of mobile eye health care units including eye camps and practical participation in the same guidelines for conducting eye camps, cause of visual impairment and blindness, national programme for prevention and control of blindness.

Community Ophthalmology (Eye Camps)

- Eye screening programmes, school clinics and surveys
- Blind person and his problems, rehabilitation of the blind
- Health Education in the field of Eye care Organization of Eye Camps
- Eye Donation motivation

Lectures on General First-aid, resuscitation and Bandages

Practicals

Semester I

- Reception and registration and record keeping
- OPD posting
- Vision and refraction
- Minor operative techniques
- Ward posting
- Workshops making and fitting of glasses

Semester II

- Making and fitting of glasses
- Refractive errors and their determination
- Maintenance of ophthalmic equipment
- Contact lenses
- Orthoptic and pleoptics
- Refractive errors and their determination
- Theatre – its sterilization and sterilization of ophthalmic and surgical instrument

Semester III

- Community ophthalmology and camps
- Refractive errors and their determination in camps
- Low visual aids
- Ocular prosthesis

Semester IV

- Investigation procedures
- Optical workshop
- Refractive errors and their determination
- Theatre assistance
- Contact Lenses

Practical Training Programme

01.	Reception / Record keeping : Practice as an Eye Care professional.	
02.	Refraction:	
	Vision Recording – distance/near	500 cases
	Colour vision (Ishihara) recording	50 cases
	Lensometry and vertex refractionometer	500 cases
	Retinoscopy and prescription of glasses	200 cases
	Subjective verification and PMT	300 cases
	Measurement and verification of IPD	300 cases
	Centering and decentering	50 cases
	Transposition and decentering	50 cases
	Auto refractor	50 cases
03.	Visual Fields	
	Peripheral & central	20 cases
	Fluorescein angiography	20 cases
	Ultrasonography	20 cases
04.	Treatment room and minor surgical procedures	
	Instillation of drops	100 cases
	Sub conjunctival injection	50 cases
	Laying the trolley for minor surgery	25 cases
	Syringing	100 cases
	Tonomtery (and Tonometre care)	50 cases
	Epilation	10 cases
	Corneal suture removal	10 cases
05.	Eye OPD : Eye Disease : (during Rotational Duty)	
	History taking and recognition of conjunctivitis, corneal ulcer, trichiasis, entropion, cataract, glaucoma and squint etc.	100 cases
06.	Orthoptic Clinic	
	History taking record	25 cases
	Cover test Maddox rod / Maddoxc Wing	10 cases
	Convergence / accommodation (RAF rule)	10 cases
	Synaptophore and prism bar orthoptic analysis	50 cases
	Occlusion treatment	10 cases
07.	Indoor Cases (Including record keeping	
	Blood pressure, urine and smear examination	100 cases
	Laying of trolley and post-operative	
	Dressing rotational duty	
08.	Operation Theatre	
	Preparation of Theatre	5 time
	Carbolization and fumigation	5 time
	Autoclaving / sterilization of instruments, swabsticks, linen, pads, drums	5 times
	Laying of Trolley for surgery (cataract, Glaucoma, Sac, Squint etc.)	50 cases
	Maintenance of OT equipments / surgical instruments	

09. Contact Lens / Prosthesis :
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|----------------------|----------|
| Contact lens fitting | 10 cases |
| Prosthesis fitting | 10 cases |
| Keratometry | 10 cases |
| Biometry | 20 cases |
10. Maintenance of Ophthalmic Equipments / Instruments :
- Cryo, Operation Table, Operation Microscope, Slit Lamp, Ophthalmoscope, Retinoscope, Keratometer, Auto-refractor, Synaptophore, Perimeters, Trial Sets, Torches, Virectomy Machine and others.

Clinical and Practical

Semester I

- Attending OPD i.e. dilatation of pupils etc.
- Reception
- Records
- Minor Operation Techniques
- Orthoptic – I
- Ward Posting
- Pathology

Semester II

- Refraction
- Lens fitting and workshop
- Investigation
- OPD
- Operation Theatre
- Wards

Semester III

- Community ophthalmology and camps
- Refractive errors and their determination in hospital and in camps
- Theatre – its sterilization and sterilization of ophthalmic and surgical instruments in camps
- Camps – organization and conduction
- Low visual aids
- Ocular prosthesis

Semester IV

- Operation Theatre
- Salesmanship and optical corner
- OPD
- Refractive errors
- Orthoptic – II
- Ward