

1. GENERAL ANATOMY

• Introduction to Human Anatomy: • Anatomy: Definition and its relevance in medicine and optometry • Planes of the body, relationship of structures, organ system Skeletal System
• Tissues of the Body: Epithelium, connective tissue, bone and cartilage, Embryology, histology, different types of each of them, types of cells, cellular differentiation and arrangements in different tissues • Muscles: Different types of muscles, their functional differentiation, their relationship with different structures, their neural supply
• Blood vessels: Differentiation between arteries and veins, embryology, histology of both arteries and veins, Functional differences between the two, anatomical differences at different locations • Lymphatic system: Embryology, functions, relationship with blood vessels and organs
• Skin and appendages: Embryology, anatomical differences in different areas, functional and protective variations, innervations, relationship with muscles and nerves • Glands: Embryology, different types of glands (exocrine and endocrine), functional differences, neural control of glands
• Nervous system: Parts of Nervous system, cell types of nervous system, Blood-brain barrier, Reflex arc, Peripheral Nerves, Spinal nerves, Nerve fibers, Autonomic Nervous system • Brain and Cranial nerves: Major parts of Brain, Protective coverings of the Brain, Cerebrospinal Fluid, Brain stem, Cerebellum, Diencephalon, Cerebrum, Cranial nerves

2. GENERAL PHYSIOLOGY

• Cell structure & organization • Tissue organization, Epithelium, Connective tissue –Collagen fibers –Elastic fibers –Areolar fibers, Cartilage –Bone, Contractile tissue –striated –skeletal –cardiac –non striated –plain –myoepithelial, General principles of cell physiology, Physiology of skeletal muscle
• Blood: Composition, Volume measurement & variations, Plasma proteins –classification & functions, Red blood cells – development, morphology & measurements –functions & dysfunctions., White blood cells –development –classification, morphology –functions & dysfunctions, Platelets –morphology – development, functions & dysfunctions, Clotting – factors – mechanism –anti- coagulants dysfunctions, Blood grouping – classification – importance in transfusion, Rh factor & incompatibility, Suspension stability, Osmotic stability, Reticulo endothelial system: Spleen, lymphatic tissue, Thymus, bone marrow, immune system, cellular, Humoral, Autoimmune system
• Digestion: General arrangement, functions & regulations: Salivary digestion, Gastric digestion, Pancreatic digestion, Intestinal digestion, Liver & bile, Absorption, • Motility, Deglutition, Vomiting-Defecation-Functions of large intestine-Neurohumoral regulations of alimentary functions • Excretion: Body fluids –distribution, measurement & exchange, Kidney –structure of nephron –mechanism of urine formation – composition of the urine and abnormal constituents –urinary bladder & micturition

3. GENERAL BIOCHEMISTRY

• Amino acids - classification, symbols, structures and properties - Proteins - primary structure, secondary structure, tertiary structure and quaternary structure - examples with biological functions • Carbohydrates - classification, structure and functions of mono-, di-, oligo- and polysaccharides - Glycoconjugates - proteoglycans, glycoproteins and glycolipids • Lipids - structure and functions of fatty acids, triacylglycerols, phospholipids and glycolipids • Enzyme nomenclature - derivation of Michaelis-Menten equation, significance and its limitations, Lineweaver-Burk equation and its plot - factors affecting the rate of enzymatic reactions - enzyme regulation - covalent modification, allosteric modification, positive and negative co-operativity - enzyme inhibition - reversible and irreversible inhibitions.
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Mechanism of enzyme catalysis - proximity effect, general acid-base reaction, electrostatic interaction, etc., that recurs in enzyme reactions; mechanism of action of chymotrypsin, lysozyme, ribonuclease-A and carboxypeptidase
- Carbohydrate metabolism - glycolysis (aerobic and anaerobic), feeder pathways of glycolysis, gluconeogenesis, glycogenolysis, glycogenesis, pyruvate oxidation, TCA cycle, glyoxylate cycle and pentose phosphate pathway - pathway, control and energetics - Nucleic acids metabolism - Purines and Pyrimidines- synthesis, degradation and its control
Amino acids metabolism - transamination, oxidative deamination, urea cycle, breakdown of amino acids leading to pyruvate, acetyl CoA, α-ketoglutarate and succinyl CoA - lipids metabolism - fatty acids, phospholipids and cholesterol - synthesis, degradation and its control
Electron transport chain and its complexes; oxidative phosphorylation: chemiosmotic theory; proton motive force, ATP synthesis - rotational catalysis; uncouplers of oxidative phosphorylation; control of ATP production

4. PHYSICAL OPTICS

- Nature of light -light as electromagnetic oscillation -wave equation; ideas of sinusoidal oscillations -simple harmonic oscillation; transverse nature of oscillation; concepts of frequency, wavelength, amplitude and phase. - Sources of light; Electromagnetic Spectrum, Radiometry; solid angle; radiometric units; photopic and scotopic luminous efficiency and efficacy curves; photometric units. Inverse square law of photometry; Lambert's law. Other units of light measurement; retinal illumination; Trolands
INTERFERENCE: Interference of Light - Principle of Super Position - Coherence, Coherent, sources, Constructive interference, Destructive interference - Young's double slit Experiment- band width - Colors of Thin Films - Newton's Rings - Determination of Wavelength - Air wedge - Determination of diameter of a thin wire by air wedge Michelson's Interferometer and its Applications.
DIFFRACTION: Fresnel's Diffraction - Zone Plate and a Convex Lens - Diffraction at Circular aperture, Opaque circular disc, Straight edge and Narrow wire - Fraunhofer's Diffraction - Diffraction at a Slit, Circular Aperture and Disc - Theory of Plane Transmission Grating. Resolution of Images - Rayleigh's Criterion - Resolving Power of Telescope, Microscopes, Prisms and Grating.. Scattering; Raleigh's scattering; Tyndall effect.
POLARIZATION: Double Refraction - Brewster's Law - Nicol Prism - polarizer and analyzer - Huygens Explanation of double refraction - Elliptically & Circularly polarized light - Quarter Wave and Half Wave Plates - Polaroids and their uses -Optical Activity - Fresnel's Explanation - Bi quartz Polarimeter - Determination of Specific Rotatory Power using Half Shade Polarimeter. Fluorescence and Phosphorescence- Introduction to Fluorescence and Phosphorescence, Applications of Fluorescence
LASERS: Introduction -Basic Principle of LASER - spontaneous and stimulated emission, Coherence -Population Inversion - Different Types of Pumping -Systems - characteristics of LASER. Types of Laser: He-Ne Laser - Nd- YAG laser - CO₂Laser - Semiconductor Laser - 3-D Profiling Using Lasers - Applications of Laser in Field of Medicine - ophthalmic applications.

5. MATHEMATICS & GEOMETRICAL OPTICS-I

Trigonometry: Complex numbers, DeMoivre's Theorem and important deductions, Trigonometric and exponential forms of complex numbers and applications. Expansion of $\sin q$, $\cos q$ and $\tan q$ in terms of q. Algebra: Combinations; Binomial theorem for any index
Definition of scalars, vectors and matrices. Addition and subtraction of vectors and matrices; vector norm and matrix determinants. Dot and cross products; angle between vectors. Multiplication of two matrices. Inverse of matrices; solution of simultaneous linear equations using matrices. Concepts of groups, rings and vector spaces. Definition of linearity and applications
Wavefronts-spherical, elliptical and plane; Curvature and vergence; rays; convergence and divergence in terms of rays and vergence; vergence at a distance. Refractive index; its dependence on wavelength. Fermat's and Huygen's Principle -Derivation of laws of reflection and refraction (Snell's law) from these principles

- Plane mirrors –height of the mirror; rotation of the mirror, Reflection by a spherical mirror –paraxial approximation; sign convention; derivation of vergence equation, Imaging by concave mirror, convex mirror, Reflectivity; transmissivity; Snell's Law, Refraction at a plane surface, Glass slab; displacement without deviation; displacement without dispersion
- Thick prisms; angle of prism; deviation produced by a prism; refractive index of the prism, angular dispersion; dispersive power; Abbe's number, Definition of crown and flint glasses; materials of high refractive index, Thin prism –definition; definition of Prism diopter; deviation produced by a thin prism; its dependence on refractive index

6. INTRODUCTION TO OPTOMETRY

- Introduction to optometry, Definition, Rights and Responsibilities
- Integration of basic sciences and support courses to Optometry
- Role of optometry in comprehensive eye care.
- Introduction to Primary eye care, Blindness, Vision impairment, Refractive errors, common ocular diseases like cataract, diabetic retinopathy, glaucoma
- Disciplines in Optometry: Binocular vision, Contact lens, Low vision care, Occupational optometry and Sports Optometry etc.
- Background of the profession: Allied and Health care Profession, Systems and streams of different professions and the position of optometry
- Evolution of optometry in India Global practice trends of optometry
- What does it take to become a healthcare professional?

7. NUTRITION

- Introduction: Food groups, RDA, Balanced diet, diet planning. Assessment of nutritional status. Energy: Units of energy, Measurements of energy and value of food, Energy expenditure. Total energy/calorie requirement for different age groups and diseases. Satiety value, Energy imbalance- obesity, starvation. Limitations of the daily food guide. Nutrients and Nutrient derivatives relevant to ocular health: Proteins, Lipids, carbohydrates, vitamins, minerals and trace elements, carotenoids, oxidative stress and the eye.
- Nutrition deficiency and ocular disease: Vitamin A deficiency, Vitamin C deficiency and ocular disease, Vitamin E deficiency, retinitis pigmentosa.
- Nutrition and Ocular Senescence: Nutrition and malnutrition in older people, Dry eye disorders, Glaucoma, Cataract, and Age- related macular degeneration. Contraindications, adverse reactions and ocular nutritional supplements.
- Recent Advance in research into nutrition related eye health: Age related eye disease study (AREDS), Carotenoids in Age related eye disease study (CAREDS),

8. COMMUNICATION

- Vocabulary, Synonyms, Antonyms, Prefix and Suffix, Homonyms, Analogies and Portmanteau words, Active, Passive, Direct and Indirect speech, Prepositions, Conjunctions and Euphemisms. Letter Writing, Email, Essay, Articles, Memos, one word substitutes, note making and Comprehension, Summary writing, Creative writing, newspaper reading. Importance of speaking efficiently, Voice culture, Preparation of speech. Secrets of good delivery, Audience psychology, handling
- Communication process, Elements of communication, Barriers of communication and how to overcome them. Nuances for communicating with patients and their attenders in hospitals.
- Listening Process, Barriers to Listening, Types of Listening, Importance of listening, Good and persuasive listening, Characteristics of a good listener. Efficient and fast reading, Awareness of existing reading habits, Tested techniques for improving speed, Improving concentration and comprehension through systematic study. Basics of non-verbal communication, Rapport building skills using neuro- linguistic programming (NLP)

9. CLINICAL OPTOMETRY I

Practicals:

1. Observe the basic operations of the optometry clinic while interacting with the team members involved in providing optimal care to patients.
2. Setting up of an optometric work up room
3. Introduction to relevant terminologies, equipment and techniques used for treatment.
4. Tour the hospital and get to know other departments in a tertiary eye care hospital and provide a report on the observation
5. Coverage on the process of the clinic/ hospital, creating and maintaining medical records (electronic),
6. Processes and guidelines in the Human resources department during the studentship along with the roles and responsibilities of the students,
7. Observation in clinical and non-clinical processes of the Optometry/ Optical Department. Depending on the availability of the other departments like Disposals of the medical and non- medical waste in the system, Department of Bioengineering, Patient services, eye banks, multimedia/ Web development etc observations can be encouraged.
8. Basic Life Support Skills Training
9. Observation at the Hospital infection control and Safety and the Quality Control System
10. Training on basic clinical protocol for community outreach

10. GENERAL PHARMACOLOGY

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| <ul style="list-style-type: none">• General Pharmacology: Introduction & sources of drugs, Routes of drug administration, Pharmacokinetics (emphasis on ocular pharmacokinetics), Pharmacodynamics & factors modifying drug actions |
| <ul style="list-style-type: none">• Systemic Pharmacology: Autonomic nervous system, Cardiovascular system: Anti-hypertensive and drugs useful in Angina; Diuretics: Drugs used in ocular disorders; Central Nervous System: Alcohol, sedative hypnotics, Depressants. Histamines and Anti histamines, Serotonin, Prostaglandin |
| <ul style="list-style-type: none">• General & local anaesthetics, Opioids & non-opioids; Chemotherapy: Introduction on general chemotherapy, Specific chemotherapy -Antiviral, antifungal, antibiotics; Hormones: Corticosteroids, Antidiabetics; Blood Coagulants |
| <ul style="list-style-type: none">• Principles and classification of autonomic drugs, Sympathomimetics - Sympatholytics, Parasympathomimetics- Parasympatholytics, Diagnostic use of autonomic drugs, Sulfonamides, Antibiotics, Anaesthetics-Proteolytic enzymes |

11. GENERAL PATHOLOGY

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| <ul style="list-style-type: none">• Modes of cell injury, Necrosis & gangrene, Inflammation and repair (Chronic and Acute), Infection in general, Specific infections: Tuberculosis, Leprosy, Syphilis, Fungal infection, Viral, chlamydial infection |
| <ul style="list-style-type: none">• Neoplasia, Haematology, Anemia, Leukemia, Bleeding disorders. Circulatory disturbances: Thrombosis, Infarction, Embolism, Hypersensitivity reactions |
| <ul style="list-style-type: none">• Clinical pathology: Immune system, Shock, Anaphylaxis, Allergy |

12. OCULAR AND RELATED NEURO- ANATOMY

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| <ul style="list-style-type: none">• Ocular Embryology. Ocular Structures: Eyeball, Visual pathway, orbit, extraocular muscles and appendages. Ocular Embryology. Eyebrows: Gross anatomy, structure, vessels and nerves, functions. Orbit: Bony orbit, periorbita, orbital fascia, surgical spaces in the orbit, orbital fat and reticular tissue, apertures at the base of orbit, contents of the orbit; Paranasal sinuses. Anatomy of eyelids: Gross, structure, Glands of eyelids, vessels and nerves. Extraocular muscles: rectus, oblique, nerve supply, blood supply. |
| <ul style="list-style-type: none">• Conjunctiva: Parts of conjunctiva, Structure of conjunctiva, the conjunctival glands, Plica semilunaris, the caruncle, Blood supply of the conjunctiva, venous drainage of conjunctiva, lymphatics of the conjunctiva, nerve supply of conjunctiva. Cornea: Dimensions, histology, blood supply, nerve supply, Limbus: Anatomical limbus, surgical limbus, cataract incision; Sclera: Thickness of sclera, special regions of the sclera, scleral apertures, microscopic |

structure, nerve supply, Uvea : iris, ciliary body choroid, blood supply; Aqueous Humour: Ciliary body, posterior chamber, anterior chamber, angle of the anterior chamber, Gonioscopic grading of the angle, Aqueous outflow system
The crystalline lens: structure of the lens, ciliary zonules. Vitreous Humour: general features, Structure (Hyaloid membrane, cortical vitreous, medullary vitreous), attachments, vitreous base. Retina and Visual Pathway : Gross anatomy of retina, microscopic structure, blood-supply of retina, blood retinal barrier; Anatomy of different components of visual pathway, arrangement of nerve fibres, blood supply, lesions of visual pathway.
Lacrimal apparatus: Lacrimal glands (main and accessory; structure, blood supply, lymphatic drainage, nerve supply), Lacrimal passages (Puncta, canaliculi, lacrimal sac, nasolacrimal duct, blood supply, nerve supply). Tear film: Functions, structure (all layers), Physical properties, Chemical composition (water, proteins, metabolites, electrolytes, and lipids). Blood vessels and ocular circulations: Blood vessels – arteries and venous drainage; Ocular circulation – structural characteristics of ocular vessels. Orbital Nerves: Oculomotor, trochlear, abducent, trigeminal, facial, autonomic nerves
Central nervous system: Spinal cord and brain stem, Cerebellum, Cerebrum. Nervous system: Neuron –Conduction of impulse –synapse –receptor, Sensory organization – pathways and perception, Reflexes – cerebral cortex –functions. Thalamus –Basal ganglia, Cerebellum, Hypothalamus, Autonomic nervous system –motor control of movements, posture and equilibrium , Conditioned reflex, eye hand co-ordination

13. OCULAR AND RELATED NEUROPHYSIOLOGY

Protective mechanisms in the eye: Eye lids and lacrimation, description of the globe, Extrinsic eye muscles, their actions and control of their movements, Coats of the eye ball, Ocular, movements and saccades
Cornea, Aqueous humor and vitreous: Intra ocular pressure, Iris and pupil, Crystalline lens and accommodation – presbyopia, Mechanism of accommodation, Retina – structure and functions
Vision – general aspects of sensation, Pigments of the eye and photochemistry, The visual stimulus, refractive errors, Visual acuity, Vernier acuity and principle of measurement, Visual perception – Binocular vision, stereoscopic vision, optical illusions
Visual pathway, central and cerebral connections, Introduction to electro physiology, Retinal sensitivity and Visibility, Receptive stimulation and flicker
Colour vision and colour defects. Theories and diagnostic tests, Scotopic and Photopic vision, Color vision, Color mixing, Visual perception and adaptation, Introduction to visual psychology (Psychophysics)

14. OCULAR BIOCHEMISTRY

Importance of ocular biochemistry in ophthalmic practice; Tear film – Functions of Tear film. Different layers of Tear film.
Chemical composition of tears. Tear film abnormalities. Tests for film Adequacy, Cornea – Biochemical composition of cornea. Sources of Nutrients-Oxygen, Glucose, Amino acid. Metabolic pathway in cornea – Glycolysis, HMP shunt
Lens – Biochemical composition of lens. Lens protein – their types & characteristics. Lens Metabolism - Carbohydrate metabolism, protein metabolism. Cataract – Due to biochemical defects of lens. Antioxidant mechanism in the lens
Retina – structure – composition – photoreceptor cell – metabolism and functions – phagocytosis; Retinal neurochemistry – Monoamines – acetylcholine – GABA – amino acids – taurine – neuropeptides – Biochemical correlates of retinal diseases
Biochemistry of the visual process; Photopigments – Rhodopsin & Iodopsin. Chemical nature of Rhodopsin. Visual cycle (Bleaching of Rhodopsin, Transducin cycle, Role of Phosphodiesterases)
Technique: Colloidal state, sol. Gel. Emulsion, dialysis, electrophoresis. pH buffers mode of action, molar and percentage solutions, photometer, colorimeter and spectrometry. Radio isotopes: application in medicine and basic research.

15. GEOMETRICAL OPTICS II

• Vergence and vergence techniques revised. Gullstrand's schematic eyes, visual acuity, Stile Crawford. Emmetropia and ametropia
• Blur retinal Imaginary, Correction of spherical ametropia, vertex distance and effective power, dioptric power of the spectacle, to calculate the dioptric power, angular magnification of spectacles in aphakic. Astigmatism. - To calculate the position of the line image in a spherocylindrical lens.
• Thin lens model of the eye -angular magnification -spectacle and relative spectacle magnification. Aperture stops- entrance and exit pupils. • Aberrations Spherical - Coma - Oblique astigmatism - Curvature of the field - Distortion - Chromatic (longitudinal and lateral) - higher order aberrations.
• Telescopes and Microscopes, Accommodation - Accommodation formulae and calculations. angular magnification of spectacle lens, near point, calculation of add, depth of field.

16. BASICS OF COMPUTERS

1. Introduction to computer: Input and output devices: Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices, Introduction of windows, Introduction of Operating System
2. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.
3. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.
4. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
5. Computer networks: introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), Internet and its Applications.
6. Introduction to computer applications in health and hospital data management system

17. CLINICAL OPTOMETRY II

1. History Taking in systemic conditions and its relevant ocular implications
2. General medications and its systemic conditions
3. Interpretation of lab reports: Blood reports, urine reports, endocrinology reports
4. Estimation of random blood sugar
5. Estimation of Blood Pressure and pulse rate
6. Demonstration of CPR
7. Clinical Assessment of cranial nerve functions
8. Visual Acuity tests for adult and children
9. Basic Binocular Vision tests
10. Tear film and lid assessment

18. GENERAL AND OCULAR MICROBIOLOGY

• Introduction to Microbiology: History and scope of Medical Microbiology; Prokaryotic Cell structure and functions; Eukaryotic Cell structure and functions; Overview of Bacteriology, Mycology, Virology and Protozoology; Ocular microbiology - Normal ocular flora; Control of Microbial Growth - Antimicrobial methods and Chemotherapy; Basic Laboratory techniques.
• Sterilization in ophthalmic practice: Heat (dry & wet heat - steam under pressure autoclaving), radiation, filter, chemicals; control of efficacy of sterilization. Disinfection procedure - glutaraldehyde (2%), chlorhexidine, alcohol, iodine; preventive methods - hand washing, needle stick/slash policy; methods to disinfect tonometer and Slit lamp biomicroscope; Preventative method in operation theatre - attire, caps & masks, hand washing, cleaning procedure.
• Ocular Immunology: Innate and adaptive immunity; Hypersensitivity responses - Anaphylactic hypersensitivity, cytotoxic hypersensitivity, Complex-mediated hypersensitivity, Delayed hypersensitivity; Autoimmunity; Host parasite relationship.

- Ocular Bacteriology: Ocular Bacterial diseases, Pathological mechanisms, Immunity, Laboratory diagnosis
- Ocular Mycology: Ocular Mycotic diseases, Laboratory diagnosis
- Ocular Virology: Ocular Viral infections, Immunity, Laboratory diagnosis;
- Ocular Parasitology: Acanthameba, Toxoplasma, Onchocerciasis, Toxocariasis, Cysticercus cellulosae (larval form of Taenia solium), Phthiriasis
- Hospital borne ocular infections: postoperative endophthalmitis, conjunctivitis, infections transmitted through corneal transplantations, hepatitis, HIV; high risk areas and staff; preventive methods, AIDS protocol, infective waste disposal

19. OCULAR PHARMACOLOGY

- Ocular Pharmacology: Ocular preparations, formulations and requirements of an ideal agent. Ocular Pharmacokinetics, methods of drug administration & Special drug delivery system; Ocular Toxicology
- Diagnostic & Therapeutic applications of drugs used in Ophthalmology: Diagnostic Drugs & biological agents used in ocular surgery, Anaesthetics used in ophthalmic procedures, Anti-glaucoma drugs
- Pharmacotherapy of ocular infections –Bacterial, viral, fungal & chlamydial infections
- Pharmacotherapy of Drugs used in allergic, inflammatory & degenerative conditions of the eye
- Pharmacotherapy of Immune modulators in Ophthalmic practice, Wetting agents & tear substitutes, Antioxidants

20. VISUAL OPTICS I

- Review of Geometrical Optics: Vergence and power. Conjugacy, object space and image space, Sign convention, Spherical refracting surface, Spherical mirror; catoptric power, Cardinal points, Magnification, Light and visual function, Clinical Relevance of: Fluorescence, Interference, Diffraction, Polarization, Bi-refringence, Dichroism. Aberration and its application Spherical and Chromatic aberration
- Optics of Ocular Structure: Cornea and aqueous, Crystalline lens, Vitreous, Schematic and reduced eye
- Measurements of Optical Constants of the Eye, Corneal curvature and thickness, Keratometry, Curvature of the lens and ophthalmophakometry
- Axial and axis of the eye, Basic Aspects of Vision. Visual Acuity, Light and Dark Adaptation, Color Vision, Spatial and Temporal Resolution, Science of Measuring visual performance and application to Clinical Optometry
- Refractive anomalies and their causes, Etiology of refractive anomalies
- Contributing variability and their ranges, Populating distributions of anomalies. Optical component measurements. Growth of the eye in relation to refractive errors

21. OPTOMETRIC OPTICS

- Introduction –Light, Mirror, Reflection, Refraction and Absorption. Lenses –Definition, units, terminology used to describe, form of lenses Vertex distance and vertex power, Effectivity calculations
- Lens shape, size and types i.e. Spherical, cylindrical and Sphero-cylindrical
- Transpositions –Simple, Toric and Spherical equivalent, Surfacing of spherical and cylindrical lenses
- Spherometer & Sag formula, Edge thickness calculations, Manufacturing of lenses, Inspection of Lenses
- Prisms –Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units, Sign Conventions, Fresnel's prisms, rotary prisms. Prismatic effect, centration, decentration and Prentice rule, Prismatic effect of Plano-cylinder and Sphero-cylinder lenses
- Lens Designs: Single Vision, Bifocals and Multifocal Lenses.
- Tints and Protective Lenses, Special design lenses, Aberration in Ophthalmic Lenses

22. OCULAR DISEASES I

• Orbit • Applied Anatomy, Proptosis (Classification, Causes, Investigations) • Enophthalmos, Developmental Anomalies (craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome) • Orbital Inflammations (Preseptal cellulites, Orbital cellulitis Orbital Periostitis, cavernous sinus Thrombosis) • Grave's Ophthalmopathy, Orbital tumors (Dermoids, capillary haemangioma, Optic nerve glioma), Orbital blowout fractures, Orbital surgery (Orbitotomy), Orbital trauma, Approach to a patient with proptosis
• Lids • Applied Anatomy, Congenital anomalies (Ptosis, Coloboma, Epicanthus, Distichiasis, Cryptophthalmos) Oedema of the eyelids (Inflammatory, Solid, Passive edema) Inflammatory disorders (Blepharitis, External Hordeolum, Chalazion, Interalthordeolum, Molluscum Contagiosum) Anomalies in the position of the lashes and Lid Margin (Trichiasis, Ectropion, Entropion, Symblepharon, Blepharophimosis, Lagophthalmos, Blepharospasm, Ptosis). Tumors (Papillomas, Xanthelasma, Haemangioma, Basal carcinoma, Squamous cell carcinoma, sebaceous gland melanoma)
• Lacrimal System: Applied Anatomy, Tear Film, The Dry Eye (Sjogren's Syndrome), The watering eye (Etiology, clinical evaluation), Dacryocystitis, Swelling of the Lacrimal gland (Dacryoadenitis)
• Conjunctiva • Applied Anatomy, Inflammations of conjunctiva (Infective conjunctivitis - bacterial, chlamydial, viral, Allergic conjunctivitis, Granulomatous conjunctivitis) • Degenerative conditions (Pinguecula, Pterygium, Concretions) Symptomatic conditions (Hyperaemia, Chemosis, Ecchymosis, Xerosis, Discoloration), Cysts and Tumors
• Cornea • Applied Anatomy and Physiology, Congenital Anomalies (Megalocornea, Microcornea, Cornea plana, Congenital cloudy cornea), Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and Non ulcerative. Etiological classifications: Infective, Allergic, Trophic, Traumatic, Idiopathic) • Degenerations (classifications, Arcussenilis, Vogt's white limbal girdle, Hassal-henle bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodular degeneration, Droplet keratopathy, Pellucid Marginal degeneration) • Dystrophies (Reis Buckler dystrophy, Recurrent corneal erosion syndrome, Granular dystrophy, Lattice dystrophy, Macular dystrophy, cornea guttata, Fuch's epithelial endothelial dystrophy, Congenital hereditary endothelial dystrophy) • Keratoconus, Keratoglobus, Corneal oedema, Corneal opacity, Corneal vascularisation, Penetrating Keratoplasty
• Uveal Tract and Sclera • Applied Anatomy, Classification of uveitis, Etiology, Pathology, Anterior Uveitis, Posterior Uveitis, Purulent Uveitis, Endophthalmitis, Panophthalmitis, Pars Planitis, Tumors of uveal tract (Melanoma), Episcleritis and scleritis, Clinical examination of Uveitis and Scleritis

23. INDIAN MEDICINE AND TELEMEDICINE

• Introduction to healthcare delivery system • Healthcare delivery system in India at primary, secondary and tertiary care • Community participation in healthcare delivery system Health system in developed countries. • Private Sector • National Health Mission National Health Policy • Issues in Health Care Delivery System in India
• National Health Programme-Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.
• Introduction to AYUSH system of medicine • Introduction to Ayurveda. • Yoga and Naturopathy • Unani

- Siddha
- Homeopathy
- Need for integration of various system of medicine
- Health scenario of India- past, present and future
- Telemedicine: Structure, components, Dissemination and Impact

24. CLINICAL OPTOMETRY III

1. Evaluation of EOM, Cover test, Hirschberg Test
2. Measurement of NPA, NPC, Stereopsis
3. Pupillary evaluation
4. Tests for Colour vision
5. Procedure of Confrontation
6. Measurement of IPD
7. Lensometry
8. Keratometry
9. Placido disc
10. Ptosis evaluation
11. Proptosis evaluation
12. Anterior segment evaluation – Torch light and slit lamp evaluation
13. Photostress recovery test
14. Red saturation test

25. OPTOMETRIC INSTRUMENTS

• Optotypes and MTF, Spatial Frequency Test charts standards. • Choice of test charts Trial case lenses • Refractor (phoropter) head units Optical considerations of refractor units
• Trial frame design • Near vision difficulties with units and trial frames Retinoscope – types available • Adjustment of Retinoscopes- special features Objective optometers. • Infrared optometer devices
• Projection charts • Illumination of the consulting room. Brightness acuity test • Vision analyzer Pupilometer • Potential Acuity Meter Abberometer
• Ophthalmoscopes and related devices, Design of ophthalmoscopes – illumination, Design of ophthalmoscopes- viewing, Ophthalmoscope disc • Filters for ophthalmoscopy, Indirect ophthalmoscope
• Lensometer • Lens gauges or clock Slit lamp Tonometers
• Keratometer and corneal topography Refractometer • Orthoptic Instruments (Synaptophore Only) Color Vision Testing Devices
• Fields of Vision And Screening Devices Scans • Electrodiagnostics New Instruments

26. CLINICAL EXAMINATION OF THE VISUAL SYSTEM

• History taking, Visual acuity estimation, Extraocular motility, Cover test, Alternating cover test, Hirschberg test, Modified Krimsky, Maddox Rod, Saccades and pursuit test
• Pupils Examination, Color Vision, Stereopsis, Confrontation test, Photostress test, Amsler test, Contrast sensitivity function test
• External examination of the eye, Slit lamp biomicroscopy, Van Herrick, Tonometry, ROPLAS, Schirmer's, TBUT, tear meniscus level, NITBUT (keratometer), Ophthalmoscopy

27. VISUAL PERCEPTION AND PSYCHOPHYSICS

- Visual Physiology: Processing of light at each layer of retina, Types of Bipolar cells, ganglion cells, Receptive fields, Post retinal visual pathways in terms of visual processing, Duplex retina - Scotopic and photopic visual system, absolute sensitivity of vision, parallel pathways - parvo and magnoretinogeniculate pathway, postnatal human vision development
- Introduction to Psychophysics: Weber's Law and Fechner's Law, Classical concepts of thresholds, Modern concepts of thresholds - statistical nature of thresholds; internal and external noise; factors affecting thresholds, Psychophysical methods of threshold estimations - methods of limits, staircase and adaptive techniques of threshold estimation, forced-choice procedures
- Spatial & temporal aspects of vision: Basic concepts of photometry and radiometry, λ function/ Luminance/ Illuminance, Modulation transfer function (MTF), contrast sensitivity function (CSF), Effect of optical and neural disorders on the CSF, Spatial summation, Ricco's law, differences between acuity types, conversion of visual acuity to grating acuity, Nyquist limit, Temporal procession of vision, Critical flicker frequency (CFF), temporal summation, Bloch's law, Motion perception, Depth perception - monocular and binocular depth cues
- Color vision: Rod and Cone Spectral Sensitivity Function, Theories of colour vision - trichromatic theory and colour opponent theory, visual processing involved in color perception, clinical testing of color vision and principles

28. VISUAL OPTICS II

- Accommodation & Presbyopia, Far and near point of accommodation, Range and amplitude of accommodation, Mechanism of accommodation, Variation of accommodation with age, Anomalies of accommodation, Presbyopia, Hypermetropia and accommodation
- Convergence: Type, Measurement and Anomalies
- Relationship between accommodation and convergence-AC/A ratio
- Objective Refraction (Static & Dynamic), Streak retinoscopy, Principle, Procedure, Difficulties and interpretation of findings, Transposition and spherical equivalent, Dynamic retinoscopy various methods
- Radical retinoscopy and near retinoscopy, Cycloplegic refraction
- Subjective Refraction: Principle and fogging, Fixed astigmatic dial (Clock dial), Combination of fixed and rotator dial (Fan and block test), J.C.C
- Duochrome test, Binocular balancing- alternate occlusion, prism dissociation, dissociate Duochrome balance, Borish dissociated fogging, Binocular refraction-Variou techniques, Prescribing guidelines, Understanding Myopia: Theories, definitions, myopia management, recent advancements
- Effective Power & Magnification : Ocular refraction vs. Spectacle refraction
- Spectacle magnification vs. Relative spectacle magnification, Axial vs. Refractive Ametropia, Knapp's law, Ocular accommodation vs. Spectacle accommodation, Retinal image blur-Depth of focus and depth of field

29. OCULAR DISEASE II

- Retina and Vitreous: Applied Anatomy, Congenital and Developmental disorders (Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery)
- Inflammatory disorders (Retinitis: Acute purulent, Bacterial, Virus, mycotic)
- Retinal Vasculitis (Eales's)
- Retinal Artery Occlusion (Central retinal Artery occlusion)
- Retinal Vein occlusion (Ischaemic, Non-Ischaemic, Branch retinal vein occlusion)
- Retinal degenerations: Retinitis Pigmentosa, Lattice degenerations
- Macular disorders: Solar retinopathy, central serous retinopathy, cystoid macular edema, Age related macular degeneration.
- Retinal Detachment: Rhegmatogenous, Tractional, Exudative) Retinoblastoma
- Diabetic retinopathy
- Ocular Injuries: Terminology: Closed globe injury (contusion, lamellar laceration) Open globe injury (rupture, laceration, penetrating injury, perforating injury)
- Mechanical injuries (Extraocular foreign body, blunt trauma, perforating injury,

sympathetic ophthalmitis)

- Non-Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational)
- Clinical approach towards ocular injury patients
- Lens
- Applied Anatomy and Physiology, Clinical examination, Classification of cataract
- Congenital and Developmental cataract, Acquired (Senile, Traumatic, Complicated, Metabolic, Electric, Radiational, Toxic)
- Morphological: Capsular, Subcapsular, Cortical, Supranuclear, Nuclear, Polar.
- Management of cataract (Non-surgical and surgical measures; preoperative evaluation, Types of surgeries,) Complications of cataract surgery
- Displacement of lens: Subluxation, Displacement, Lens coloboma, Lenticonus, Microspherophakia.
- Clinical Neuro-ophthalmology
- Anatomy of visual pathway, Lesions of the visual pathway
- Pupillary reflexes and abnormalities (Amaurotic light reflex, Efferent pathway defect, Wernicke's hemianopic pupil, Marcus gunn pupil.
- Argyll Robertson pupil, Adie's tonic pupil)
- Optic neuritis, Anterior Ischemic optic neuropathy, Pappilloedema, optic atrophy
- Cortical blindness Malingering
- Nystagmus, Clinical examination
- Glaucoma
- Applied anatomy and physiology of anterior segment, Clinical Examination Definitions and classification of glaucoma, Pathogenesis of glaucomatous ocular damage, Congenital glaucoma, Primary open angle glaucoma
- Ocular hypertension, Normal Tension Glaucoma, Primary angle closure glaucoma (Primary angle closure suspect, Intermittent glaucoma, acute congestive, chronic angle closure) Secondary Glaucoma
- Management : common medications, laser intervention and surgical techniques

30. BEHAVIORAL HEALTH PSYCHOLOGY

- Evolution of Psychology, Personality theories, Developmental psychology; Introduction to Psychology,
- History of Psychology - Structuralism, Functionalism, Psychoanalytic of Sigmund Freud, Behaviourism, Gestalt psychology, Humanistic Psychology, Cognitive Psychology, Feministic Psychology, Multicultural Psychology
- Personality Theories: Biomedical Model, Psycholanalytic theory - Personality structure, stages, Defense mechanisms, Behavioural Psychology - Classical Conditioning, Operant Conditioning, Vicarious/Observational learning behaviour), Positive Psychology (Martin Seligman), Humanistic Psychology (Carl Roger), Maslow's Hierchy of Needs, Eclectic approach, Nature Versus Nurture of Personality
- Developmental Psychology: Psychosexual stages of development, Psychosocial stages of development, Cognitive theory of development, Theory of moral development, social Cultural development - Sigmund Freud, Erickson, Piaget, Kohlberg, Lev Vygotsky, Bronfenbrenner's.
- Introduction to Health Psychology - What is Health Psychology, Father of health Psychology, What constitutes well-being? Models of Health Psychology - Biomedical Model and Biopsychosocial model Health Behaviour models - Health Belief Model, Transtheoretical Model, social Cognitive Theory, Theory of Planned behaviour. Health Promotion - Precede Proceed model Illness belief. Beliefs that influence practitioners.
- Partnerships in health: Client-professional partnership. Issues in Client engagement with treatment, involving clients in care, chronic illness, disability, complex health issues, attitude and background of clients.
- Personality disorders. Depression Disorders. Anxiety disorders. Pain and types. Loss and models of Loss. Stress and Coping strategies.
- Compassionomics in healthcare.

31. INTRODUCTION TO QUALITY AND PATIENT SAFETY

- Quality assurance and management

• Basics of emergency care and life support skills
• Biomedical waste management and environment safety
• Infection and prevention control
• Antibiotic resistance
• Disaster preparedness and management

32. CLINICAL OPTOMETRY IV

Practicals:

1. History taking- Ocular and Special clinical conditions
2. Refraction
 - a. Subjective
 - b. Objective
3. Keratometry in special conditions like Keratoconus, High Astigmatism, Pterygium, Post ocular surgery
4. Lensometry - Bifocals and PAL's
5. Pupillometry
6. Tonometry
 - a. Applanation
 - b. Other Tonometers
7. AC Grading - Van Herick method
8. Gonioscopy

33. SYSTEMIC DISEASES

• Hypertension , Diabetes Mellitus, Acquired Heart disease, Thyroid Disease: Definition, classification, Epidemiology, clinical examination, complications, and management. Ophthalmic considerations for the diseases
• Cancer, Tropical infections, Tuberculosis, Herpes virus, Hepatitis, Acquired Immunodeficiency Syndrome: Definition, classification, Epidemiology, clinical examination, complications, and management. Ophthalmic considerations for the diseases
• Anaemia, Nutritional and metabolic disorders, Myasthenia Gravis, Connective Tissue Disease: Definition, classification, Epidemiology, clinical examination, complications, and management. Ophthalmic considerations for the diseases

34. DISPENSING OPTICS

• Lens designs - compatible to contemporary eye frames. Components of spectacle prescription & interpretation, transposition, Add and near power relation
• Frame selection –based on spectacle prescription, professional requirements, age group, face shape. Measuring Inter-pupillary distance (IPD) for distance & near, bifocal height. Lens & Frame markings, Pupillary centers, bifocal heights, Progressive markings & adjustments –facial wrap, pantoscopic tilt, Dispensing for Myopia management spectacles
• Neutralization –Hand & lensometer, axis marking, prism marking. Faults in spectacles (lens fitting, frame fitting, patients complaints, description, detection and correction).
• Recording and ordering of lenses (power, add, diameter, base, material, type, lens enhancements). Final checking & dispensing of spectacles to customers, counseling on wearing & maintaining of spectacles
• Spectacle repairs –tools, methods, soldering, riveting, Frame adjustments Special types of spectacle frames: Monocles, Ptosis crutches, Industrial safety glasses, Welding glasses, Frame availability in Indian market

35. GERIATRIC OPTOMETRY

• Aspects of ageing: Introduction to geriatrics and gerontology, epidemiology of geriatrics in India, GNFC-AOA statistics and Functional Perspective on Ageing, physiological and pathological changes in ageing
• Effects of ageing on Cardiovascular system, respiratory system, gastro- intestinal, excretory and central nervous system.
• Preventive geriatrics – Periodical health assessment, lifestyle and dietary pattern. Healthy

ageing- physical, mental and social health, Social aspects of Ageing and Psychological aspects of Ageing, Pharmacological aspects of aging

- Optometric examination and management of the elderly: Ageing changes in the eye, Optometric Examination of the Elderly patient, Fitting and Dispensing spectacle for the elderly patient, Age related Eye Diseases, Ocular Implication of systemic diseases in the elderly, Management of geriatric patients

36. PEDIATRIC OPTOMETRY

- Development of the eye and the paediatric milestones: Ocular Embryology, Developmental Milestones
- Normal appearance, pathology and structural anomalies: Orbit, Eye lids, Lacrimal system, Conjunctiva, Cornea, Sclera Anterior chamber, Uveal tract, Pupil, Lens, vitreous, Fundus Oculomotor system
- Paediatric eye disorders : Cataract, Retinopathy of Prematurity, Retinoblastoma, Neuromuscular conditions (myotonic dystrophy, mitochondrial cytopathy), and Genetics, Anterior segment dysgenesis, Aniridia, Microphthalmos, Coloboma, Albinism
- Paediatric eye examination: Overview - Paediatric eye examination, History taking Paediatric subjects, Visual Acuity Assessment in different age groups, Refractive Examination
- Determining binocular status, Determining sensory motor adaptability, Compensatory treatment and remedial therapy for: Myopia, Pseudomyopia, Hyperopia, Astigmatism, Anisometropia, Amblyopia, Remedial and Compensatory treatment of Strabismus and Nystagmus Spectacle dispensing for children, Paediatric contact lenses, Low vision assessment in children

37. DIAGNOSTICS AND THERAPEUTICS OF ANTERIOR SEGMENT DISEASES

- Pathophysiology and clinical management of systemic and anterior segment ocular disease
- Overview of drugs used in treatment of anterior segment disease
- LASER for anterior segment disease management, overview of surgical intervention for anterior segment disease
- Vertical Integration of all treatment options of anterior segment disease with special emphasis on optometric management
- Interpretation and diagnose conditions using - Biometry (Contact and Non-Contact), Corneal Topography, Pentacam, Anterior Segment Optical Coherence Tomography, Specular Microscopy, Meibography
- Interpretation and diagnose conditions using - Perimetry, Posterior segment Optical Coherence Tomography, Ultrasound Biomicroscopy, Heidelberg Retinal Tomography (Cornea and Optic Nerve)

38. INNOVATION AND TECHNOLOGY

- Research & Ideation: Concepts. Understanding design and optics behind ophthalmic instruments
- Prototype development
- Clinical validation

39. CLINICAL OPTOMETRY V

- Evidence Based Practice on the following Common Clinical Conditions
 - Myopia/ Hyperopia
 - Astigmatism
 - Presbyopia
 - Headache
- Evidence Based Practice on the following Common Clinical Conditions
 - Cataract
 - Open Angle Glaucoma
 - Angle closure glaucoma

40. CONTACT LENSES I

- Introduction to Contact lenses: Definition, Classification / Types. History of Contact Lenses. Optics of Contact Lenses: Magnification & Visual field, Accommodation & Convergence, Back & Front Vertex Power / Vertex distance calculation. Review of Anatomy & Physiology of Tear film, Cornea, Lids & Conjunctiva
- Introduction to CL materials: Monomers, Polymers, Properties of CL materials: Physiological (Dk, Ionicity, Water content), Physical (Elasticity, Tensile strength, Rigidity), Optical (Transmission, Refractive index), Indications and contraindications, Parameters / Designs of Contact Lenses & Terminology
- RGP Contact Lens materials, Manufacturing Rigid and Soft Contact Lenses – various methods, Pre-Fitting examination – steps, significance, recording of results, Correction of Astigmatism with RGP lens. Types of fit – Steep, Flat, Optimum – on spherical cornea with spherical lenses. Types of fit – Steep, Flat, Optimum – on Toric cornea with spherical lenses. Calculation and finalising Contact lens parameters.
- Ordering Rigid Contact Lenses – writing a prescription to the Laboratory. Checking and verifying Contact lenses from Laboratory. Modifications possible with Rigid lenses. Common Handling Instructions: Insertion & Removal Techniques, Do's and Don't's
- Care and Maintenance of Rigid lenses: Cleaning agents & Importance, Rinsing agents & Importance, Disinfecting agents & importance, Lubricating & Enzymatic cleaners. Follow up visit examination. Complications of RGP lenses

41. LOW VISION CARE AND REHABILITATION

- Definitions & classification of Low vision, Epidemiology of low vision, Model of low vision service
- Pre-clinical evaluation of low vision patients – prognostic & psychological factors; psychosocial impact of low vision, Types of low vision aids – optical aids, non-optical aids & electronic devices, Optics of low vision aids
- Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction & training, Pediatric Low Vision care, Low vision aids – dispensing & prescribing aspects
- Visual rehabilitation & counselling, Legal aspects of Low vision in India, Case Analysis

42. BINOCULAR VISION I

- Binocular Vision and Space perception: Relative subjective visual direction, Retino motor value, Grades of BSV, SMP and Cyclopean Eye, Correspondence, Fusion, Diplopia, Retinal rivalry, Horopter, Physiological Diplopia and Suppression, Stereopsis, Panum's area, BSV, Stereopsis and monocular clues – significance, Egocentric location, clinical applications, Theories of Binocular vision.
- Anatomy of Extra Ocular Muscles: Recti and Obliques, LPS, Innervation & Blood Supply. Physiology of Ocular movements: Center of rotation, Axes of Fick, Action of individual muscle. Laws of ocular motility: Donders' and Listing's law, Sherrington's law, Hering's law. Uniocular & Binocular movements - fixation, saccadic & pursuits: Version & Vergence, Fixation & field of fixation
- Near Vision Complex Accommodation: Definition and mechanism (process), Methods of measurement, Stimulus and innervation, Types of accommodation, Anomalies of accommodation – aetiology and management. Convergence: Definition and mechanism, Methods of measurement, Types and components of convergence - Tonic, accommodative, fusional, proximal. Anomalies of Convergence – aetiology and management.
- Sensory adaptations: Confusion, Suppression, Investigations, Management. Abnormal Retinal Correspondence: Investigation and management, Blind spot syndrome. Eccentric Fixation: Investigation and management.
- Amblyopia : Classification, Aetiology, Investigation, Management

43. DIAGNOSTICS AND THERAPEUTICS OF POSTERIOR SEGMENT DISEASES

- Pathophysiology and clinical management of systemic and posterior segment ocular disease
- Overview of drug used in treatment of posterior segment disease
- LASER for posterior segment disease management, overview of surgical intervention for

posterior segment disease

- Vertical Integration of all treatment options of posterior segment disease with special emphasis on optometric management
- Perform, interpret and diagnose anterior and posterior segment diseases images, Fundus Fluorescein Angiography, Electrodiagnostics and Visual Evoked Potential
- Perform, interpret and diagnose conditions using - Contrast acuity, Potential acuity meter, Retinometer, Brightness acuity test, Photostress test, Amsler charting

44. OPTOMETRY AND MULTIDISCIPLINARY ASPECTS OF HEALTH

- Health care models
 - International health care models
 - National health care models
 - Decentralized health care delivery systems
 - Pros and cons of different health care models
 - Universal health coverage
- General and systemic rehabilitation services
 - Models of health care for different systemic illness
 - Rehabilitation models
 - Referral to rehabilitation setups
- Primary, secondary and tertiary eye care models
 - Preventive, promotive and curative eyecare
 - Primary, secondary and tertiary eye care
- Integrating health care professions
 - Integration of primary health and primary eye care
 - Integration of eye care services to bigger model of health care
 - Problem oriented health care records
 - Co-management with other healthcare specialties
 - Development of comprehensive management plan
 - Benefits of multidisciplinary approach to eye care

45. RESEARCH METHODOLOGY & BIOSTATISTICS

- Research Methodology: Introduction to research methods, Identifying research problem, Ethical issues in research, Research design, Types of Data, Research tools and Data collection methods, Sampling methods, Developing a research proposal
- Biostatistics: Introduction, Central Limit Theorem, Measures of Morality, Sampling, Statistical significance, Correlation, Sample size determination Statistics -Collection of Data - presentation including classification and diagrammatic representation -frequency distribution. Measures of central tendency; measures of dispersion
- Statistical tests to compare means in normal and not normal distribution with one or more groups. Tests to check for association between groups. Use of computerized software for statistics

46. CLINICAL OPTOMETRY VI

- Evidence Based Practice on the following Common Clinical Conditions
 - Blepharitis/ Chalazion /Stye
 - Pinguecula, Conjunctival Cyst, Concretions, Conjunctival Naevus
 - Pterygium
 - Pseudophakia/ Aphakia
- Evidence Based Practice on the following Common Clinical Conditions
 - Dry eye
 - Esotropia/ Exotropia/ Other types of Squint

47. CONTACT LENSES II

• SCL Materials & Review of manufacturing techniques Comparison of RGP vs. SCL • Pre-fitting considerations for SCL Fitting philosophies for SCL • Fit assessment in Soft Contact Lenses: Types of fit - Steep, Flat, Optimum • Calculation and finalising SCL parameters • Disposable lenses • Advantages and availability
• Soft Toric CL • Stabilization techniques • Parameter selection • Fitting assessment
• Common Handling Instructions • Insertion & Removal Techniques • Do's and Dont's Complications of Soft lenses
• Care and Maintenance of Soft lenses • Cleaning agents & Importance • Rinsing agents & Importance • Disinfecting agents & importance • Lubricating & Enzymatic cleaners Follow up visit examination
• Therapeutic contact lenses • Indications • Fitting consideration
• Specialty fitting • Aphakia • Pediatric • Corneal ectasia • Post refractive surgery • Ocular surface disease • Occupational fitting
• Management of Presbyopia with Contact lenses

48. BINOCULAR VISION II

• Neuro-muscular anomalies
1. Classification and etiological factors History - recording and significance
• Convergent strabismus
Accommodative convergent squint
1. Classification 2. Investigation and Management
• Non accommodative Convergent squint
1. Classification 2. Investigation and Management
• Divergent Strabismus
1. Classification 2. A& V phenomenon 3. Investigation and Management
• Vertical strabismus
1. Classification 2. Investigation and Management
• Paralytic Strabismus
1. Acquired and Congenital 2. Clinical Characteristics
Distinction from comitant and restrictive Squint
• Investigations

1. History and symptoms
 2. Head Posture
 3. Diplopia Charting
 4. Hess chart
 5. PBCT
 6. Nine directions
 7. Binocular field of vision
- Treatment of Amblyopia Nystagmus
 - Non-surgical Management of Squint
 - Restrictive Strabismus
 1. Features
 2. Musculo-fascial anomalies
 3. Duane's Retraction syndrome
 4. Clinical features and management
 5. Brown's Superior oblique sheath syndrome
 6. Strabismus fixus
 7. Congenital muscle fibrosis
 - Surgical management of squint

49. PUBLIC HEALTH & EPIDEMIOLOGY

- Public Health Optometry: Concepts and implementation, Stages of diseases
- Dimensions, determinants and indicators of health
- Levels of disease prevention and levels of health care patterns
- Contrasting between Clinical and community health programs Community based rehabilitation programs
- National and International health agencies,
- Organization and Management of Eye Care Programs – Service Delivery models
- Health manpower and planning & Health Economics Evaluation and assessment of health programmes IEC Materials, KAP survey
- Principles of Epidemiology and Epidemiological Methods Health Information and Basic Medical Statistics Descriptive epidemiology: Person, place, time Prevalence, Incidence and Magnitude of diseases Screening in the detection of disease
- Sampling & Sample size determination

50. LAW AND PROFESSIONAL ETHICS – OPTOMETRY

- Medical ethics - Definition - Goal - Scope
 - Introduction to Code of conduct
 - Basic principles of medical ethics –Confidentiality
- Malpractice and negligence - Rational and irrational drug therapy
 - Autonomy and informed consent - Right of patients
- Care of the terminally ill- Euthanasia
 - Organ transplantation
- Medico legal aspects of medical records –Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects.
- Professional Indemnity insurance policy
- Development of standardized protocol to avoid near miss or sentinel events
- Obtaining an informed consent.

51. COMMUNITY EYE HEALTH

- Exclusive training of
 - School screenings.
 - Vision screening of different ages and occupations.
 - Diabetic retinopathy screening,

- Glaucoma Screening,
- Geriatric doorstep care,
- Special children vision screening.

52. CLINICAL OPTOMETRY VII

- Evidence Based Practice on the following Common Clinical Conditions
 - Corneal abrasion/ Corneal Ectasia/ Corneal Ulcer/Corneal Opacity
 - Ptosis
 - Proptosis
 - Ectropion, Entropion
- Evidence Based Practice on the following Common Clinical Conditions
 - Uveitis
 - Acute Dacryocystitis
 - Ocular Trauma

53. OCCUPATIONAL OPTOMETRY

- Introduction to occupational health, National and international organisations/agencies of occupational health, Labour reforms, Occupational health centre in organised sector, Health care for workers in unorganised sector, Role of occupational health physician, Industrial hygienist, and Safety officer; Occupational diseases and occupational related diseases, Occupational Hazards.
- Occupational optometry, role of optometrist in industry, Steps involved in occupational optometry services, Visual task analysis; Ocular injuries, Electromagnetic radiations, visual functions for different occupations, Vision standards, Personal protective equipment, Lighting and occupation, Contact lens for various occupations.
- Case studies on visual health in various occupations.

54. PRACTICE MANAGEMENT

- Business Management: Practice establishment and development, Stock control and costing, Staffing and staff relations, Business computerization
- Accounting Principles: Sources of finance, Bookkeeping and cash flow. Taxation and taxation planning
- Professionalism and Values: Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality. Personal values- ethical or moral values. Attitude and behaviour- professional behaviour, treating people equally. Code of conduct, professional accountability and responsibility, misconduct. Differences between professions and importance of team efforts
- Cultural issues in the healthcare environment

55. COMMUNITY EYE HEALTH AND TELE OPTOMETRY

- Epidemiology of blindness - Defining blindness and visual impairment. Prevalence, incidence and distribution of visual impairment. Eye in primary health care. Community Eye Care Programs
- Nutritional Blindness with reference to Vitamin A deficiency. Screening for eye diseases - Refractive errors, Low Vision, Cataract, Diabetic retinopathy, Glaucoma, Amblyopia, Squint. National and International Agencies - NPCB, IAPB, WHO. Role of an optometrist in Public Health. Optometrists' role in school eye health programmes.
- Basics of Tele Optometry and its application in Public Health. Information, Education and Communication for Eye Care programs. Health Information and Basic Medical Statistics. Communication for Health Education. Health Planning and Management. Plan and implement 2030 INSIGHT

56. DATA SCIENCE FOR HEALTHCARE

- Foundations of data science: Probability and statistics, Linear algebra for data science, Optimisation for data science

- Health care systems, types of data in healthcare, Healthcare data literacy, Health care data security, compliance and privacy
- Machine learning: foundations and algorithms, Machine learning and real world use: cases in biology and health care, disease modelling, Applications and benefits of data science

57. CLINICAL OPTOMETRY VIII

- Evidence Based Practice on the following Common Clinical Conditions
 - Convergence insufficiency/ Divergence excess
 - Post refractive surgery
 - Optic atrophy
 - Retinal Detachment
- Evidence Based Practice on the following Common Clinical Conditions
 - Retinitis pigmentosa, CSNB, Stargardt's Disease
 - Age related macular Degeneration
 - Diabetic retinopathy
 - Hypertensive Retinopathy