M.OPTOM. FIRST YEAR

Subject Code 101

Part 1. VISUAL AND CLINICAL OPTICS

Study topics for Visual Optics

1. Refractive status of the Eye
    a) Emetropia.
    b) Ametropia – Myopia, Hyperopia, Astigmatism.
        i. Prevalence.
        ii. Classification and refractive components
        iii. Progression
    c) Presbyopia.
    d) Etiology or refractive anomalies.
2. Epidemiology of Ametropia.
    a) Incidence and distribution of refractive errors in general population.
    b) Changes in refraction with Age.
    c) Hereditary and Environment al Factors.
3. Measurement of the Optical constants of the Eye.
    a) Objective methods of refraction.
        i. Retinoscopy – Principle and methods.
        ii. Pharmacology and refraction.
        iii. Other Objective methods of refraction.
    b) Subjective methods of refraction.
        i. Review of subjective refractive methods.
        ii. Monocular and binocular subjective refraction
        iii. Usefulness of various methods in finalizing the prescription.
4. Management of patient with refractive error.
    a) Analysis, interpretation and prescription for Ametropias and heteropias.
    b) Guidelines for correction of refractive errors based on-
        i. Visual needs of the patients.
        ii. Age and status of accommodation.
    c) Modes of correction – spectacles, contact lenses, refractive surgery
    d) Special conditions
        i. Infants, Toddlers, and children.
        ii. Amblyopia and strabismus.
        iii. Anisometropia and Aniseikonia.
        iv. High refractive error – Uniocular and binocular condition.
        v. Irregular corneal Astigmatism.
        vi. The elderly patients with Low Vision.

Study topics for Clinical Optics

1) Visual system and Visual Prescription.
2) The Eye as an Optical System.
3) Visual Acuity and contrast sensitivity.

4) Accommodation
    a) The basics – definition, mechanism and methods of measurement.
    b) Far and near point of accommodation, range of accommodation, amplitude – significance and application in clinical management.
    c) Anomalies of accommodation – etiology and management.
5) Accommodation, the pupil and Presbyopia.
    a) The Near addition and Ametropia.
    b) Intermediate addition and Visual requirements.
6) Convergence
    a) The basics – definition, mechanism and methods of measurement.
    b) Type and components of convergence,
    c) Anomalies of Convergence – etiology and management.
    d) Near point of convergence – significance.
7) Accommodative Convergence / Accommodation ratio.

PART 2. DISPENSING OPTICS.

Study topics for Dispensing Optics

Ophthalmic Lenses

1) Introduction, terminology, definitions – prisms, Lenses, Frames, Spectacles.
    a. Prisms. – Properties and uses in Optometry.
    b. Lenses – Definition, Terminology, forms and uses in Optics.
    c. Neutralization of Lenses – Lensometry, hand neutralization – practical aspects.
    d. Prismatic effect, centeration – decentration, Prentice's rule – applications in practice.
2) Outline of lenses surfacing and polishing, terminology used in Lens workshops
    a. Ophthalmic raw materials – history and recent developments.
    b. Manufacturing of Ophthalmic lenses – Glass, Plastics and new generation materials.
    c. ISI Standards for Ophthalmic Lenses.

3) Ophthalmic lens material and designs types
    a. Ophthalmic lens material types
        i. Glass – Mineral
        ii. Plastics – CR, Polycarbonate.
    b. Aspheric, High Index lenses and special purpose lenses.
    c. Bifocal and multifocal lenses.
    d. Absorptive and protective lenses.
    e. Sunglasses – Tinted, Phototropic, Polaroid lenses.
    f. Various surface treatments on ophthalmic lenses.
        i. Anti-reflection coatings – theory and practical aspects
        ii. Toughening – methods, uses and applications.
4) Progressive and Varifocal lenses.
    a. Properties and materials.

b. Advantages and limitations of progressive lens.
c. Indications and contraindications of progressive lens.
d. Selecting appropriate progressive lenses.
e. Precautions while prescribing progressive lenses.
f. Identifying and neutralizing progressive lenses.

Spectacle Frames.

1) History, nomenclature, classification and terminology in Spectacles.
2) Types, parts and various shapes of spectacle frames and recent advances.
3) Raw materials for spectacle frames and recent manufacturing methods.
4) Spectacle frame measurement and marking.
5) New trends – latest developments in spectacle frames.
6) Frame measurement and marking, Frame selection.
7) Measuring inter papillary distance.

Subject code 102 **Basic Sciences.**

Study topics – Ocular Anatomy

1) Outline of Visual system – latest theories and developments.
    a. Three coats of the eyeball – Outer, Middle, Inner.
    b. Conjunctiva & Sclera, Cornea & Limbus – regions, layers, functions, Significance.
    c. Uvea – Choroid, Iris, Pupil, Ciliary body, ciliary muscles, processes – layers, functions, significance.
    d. Retina – anatomical structure, layers – significance, distribution of rods and cones.
    e. Anterior chamber – structure, depth significance.
    f. Aqueous humor – secretion, and drainage aspects
    g. Crystalline Lens -structure, growth, function, significance, metabolism – ageing process.
2) Blood supply and cranial nerve supply to all parts of eye and adnexa.
3) Visual pathway – complete structure, significance.
4) Lacrimal system – apparatus, secretion and drainage system.
5) Tear Film – layers, functions, significance.
6) Ocular embryology, Time relationships in ocular embryology.
7) Understanding of Genetics for optometric counseling.

Subject Code 103 **CLINICAL SCIENCES**

Part 1. EYE EXAMINATION.

Study topic for

1) General outline of case paper for various requirements.
    a. Optometry OPD for private clinics, for hospital department.
    b. Contact Lens clinic, Orthoptic clinic, Low Vision clinic, etc.
    c. Vision screening eye camps in school, adult age group, senior citizen, special groups like computer Institute, etc.
2) Methods of record keeping methods – advantages and limitation of

a. Conventional methods using printed case paper.
b. Computer and latest technology.

3) The patient History – components and significance
    a. Problem oriented optometric records.
    b. Demographic information and patient profile.
    c. Health and medication.
    d. Family, Ocular and birth history.
    e. Chief complain.
4) The preliminary examination procedures
    a. Visual acuity and color vision.
    b. Contrast sensitivity and Glare.
    c. Ocular motility procedure.
    d. Anterior segment evaluation.
    e. Posterior segment evaluation.
5) Vision Screening, new subjective refractors and techniques.

Part 2 **SPECIAL INVESTIGATION AND INSTRUMENTS**

Study topics

1) Refraction instruments – latest designs and features available.
    a. Vision test charts, Projection charts and illumination of the consulting room.
    b. Refraction trial cases and Refractor (Phoropter) units.
    c. Instruments of the future.
2) Orthoptic Instruments – latest design and features available.
    a. Amblyoscopes and computer Orthoptics.
3) Slit lamp bio – microscopes – latest designs and features available.
4) IOP measurement, Tonometers - latest designs and features available.
5) Corneal examination equipment - latest designs and features available.
    a. Video Keratoscopy.
    b. Corneal Topography.
6) Anterior segment Ophthalmic photography - latest designs and features available.
7) Clinical Electrophysiology – introduction and significance of ERG, EOG, VER.

Subject Code 104 **Specialty subject**

Part 1 **CONTACT LENSES**

Study topic for

1) Latest trends in Contact Lens raw materials and methods of manufacturing.
2) Discussion with patient, choice of lens – type.
3) Fitting philosophies of Contact Lenses – new trends.
4) Pre-fitting examination – steps, significance, recording of results.
5) Contact lens option for Astigmatism – RGP and Soft lens design.

6) Special points for in pre fitting examination of soft Contact Lens.
7) Calculation and finalizing of Soft Contact Lens parameters.
8) Ordering Soft Contact Lenses – Writing a prescription to the Laboratory.
9) Fitting Soft lenses from stock – advantages, limitations, precautions.
10) Components of Lens Care systems – new trends.
11) Instructions to patient and dispensing Contact lenses.
12) Teaching the patient to insert and remove Soft lenses.
13) Common handling instructions to first time wearers.
14) Special instructions to the patient for using Soft lenses.
15) After care and follow-up for all Contact lens patients.
16) Patient Problems – identification, deferential diagnosis and management.
17) Ocular Complications of Contact Lens wear.
18) Practice management in contact lenses.

PART 2 BINOCULAR VISION & OCULAR MOTILITY

Study topic for

1) Extra ocular and intra ocular Muscles of the Eye – related Anatomy & Physiology.
    a. Ocular movements – Center of rotation, Axes of Fick, Uniocular and Binocular movements fixation, saccadic & pursuits, Version & Vergence.
    b. Laws of ocular motility – Donder's and listing's law, Sherrington's law, Hering's law.
    c. Vision efficiency skills – Saccadic and pursuit eye movements, fixation, accommodation and sensory fusion.
2) Binocular Vision and space perceptions development.
    a. Sensory adaptations – Confusion, Suppression, Abnormal Retinal – Correspondence and Blind spot syndrome.
    b. Fusion, diplopia, correspondence.
    c. Stereopsis, panum's area, Binocular Single Vision.
    d. Stereopsis and monocular clues – significance.
    e. Egocentric location, clinical applications.
    f. Theories of Binocular vision – Alternation, Projection and Motor theories of visual orientation.
    g. Binocular Vision – Normal and Abnormal Retinal Correspondence.
3) Outline of Routine Orthoptic examination procedures.
    a. Subjective symptoms – description and significance.
    b. History - recording and significance.
    c. Routine & Special investigations for Binocular Vision & Ocular motility.
    d. Qualitative and quantitative diagnosis of strabismus.
    e. Diagnosis, prognosis & management methodologies.
4) Clinical picture of types of squints
    a. Pseudo – strabismus.
    b. Eso and Exo deviations.
    c. Cyclo deviations and Nystagmus.

d. A and V Patterns.
e. Paralytic squint – Concomitant, Non – concomitant
f. Special forms of squint.

5) Orthoptic Instruments.
6) Genetics in occurrence of squint and binocular vision problems.

PART 3 LOW VISIONS AND PATIENT MANAGEMENT

Study topic for

1) Low vision – causes, refractive state and counseling of patient with low vision.
2) Who are Low Vision patients?
3) Examination of patient with Low Vision.
   a. Recording history, Refraction and related eye examination.
   b. Refractive considerations – conventional and prism spectacles.
   c. Effect of eye condition on Functional Vision.
   d. Diagnostic procedures in low vision cases.
4) Genetics and Low vision.
5) Optics of Low Vision Lenses.
6) Variables affecting success and how to improve results.
7) New developments and future directions.

Support subject Research Methodologies & Statistics

Study topic for

1) Introduction to research design
   - Definition, characteristics, purpose and kinds of research.
   - Ethics and Overview of research process.
   - Statement of the problem and research objectives.
2) Methods of Data Collection and Research Proposal
   - Techniques – Questioning, Observation and management.
   - Instruments – Questionnaire, Interview Schedule, Checklist, rating scale.
   - Writing a research proposal.
3) Implementation of Research Plan
   - Collection of data.
   - Data analysis – types of data, data organization and summarization.
   - Structure of statistical methods.
   - Interpretation and presentation of data.
4) Research Report
   - Composition and Format.
   - Application of result – critical analysis of reach report and publication.
5) Introduction to Statistics
6) Measures of Variability.
7) The Normal Distribution.

Support subject **Education & Teaching**

Study topic for

1) Introduction
    - Aim of education and philosophy
    - Current trends and issues in education.
2) Concept of Teaching and Learning
    - Definition of teaching and learning.
    - Relationship between teaching and learning.
3) Guidance and Counseling
    - Principles, Philosophy, purpose and concept of guidance and counseling.
    - Difference between counseling and guidance.
    - Types of guidance and counseling – Group and Individual.

M.OPTOM. SECOND YEAR

Subject Code 201 **Optics and Contact Lenses**

Study topic for

1) Co-relation of Ophthalmic, visual and Clinical Optics.
2) Optical management of Refractive errors – new modalities.
3) Advanced techniques of subjective and objective refraction.
4) Toric corneas, Irregular corneas and Keratinous.
5) Contact Lenses for Presbyopes
6) Special consideration for fitting Contact Lenses in Children.
7) Contact Lenses in Sports.
8) Extended wear lenses.
9) Dry eye and Contact lenses.
10) Therapeutic contact lenses.
11) Orthokeratology and Corneal Refractive Therapy.
12) Disposables and Frequent Replacement Lenses.
13) Cosmetic and Prosthetic contact lenses.
14) Diagnostic contact lenses.
15) Cornea in Contact Lens wear.
16) Ocular complications of Contact Lenses wear.
17) Future of Contact lenses and optometry practice.

Subject code 202 **Clinical Orthoptics**

1) Amblyopia
    a. Definition and types, Investigations, management
    b. Recent development in clinical management of Amblyopic patient.
2) Non- surgical treatment and Management in

a. Refractive Amblyopia.
b. Abnormal Retinal Correspondence.
c. Accommodation and Convergence anomalies.
d. Types of strabismus.
e. Low AC/A and High AC/A ratio condition.
f. Nystagmus.

3) Vision Therapy Eye exercises – latest techniques and home exercises.
   a. Introduction and general concepts.
   b. Anaglyphs and Polaroid filters.
   c. Lenses, Prisms and mirrors.
   d. Stereoscopes, after images, etopic phenomena.
4) Patient and practice management issues with using Vision Therapy.

Subject Code 203 **DISPENSING OPTICS & LOW VISION**

1) Optical Instruments
   a. Lensometer and Focimeters – latest designs and features available.
   b. Optical lens testing equipments
   c. IPD measurement organization.
2) Dispensing counter organization.
3) Types of human faces and cosmetic dispensing of spectacles.
4) Types of spectacle frames available- shapes, material, colour.
5) Functional dispensing – various professions and age groups.
6) Special purpose spectacles and accessories.
7) Ophthalmic lenses.
8) Lens enhancements – considerations for prescribing.
9) Special measurements for fitting special lenses – Bifocals, multifocal, prism lenses, etc.
10) Final checking, adjustments and dispensing to prescription spectacles.
11) Patient complains, handling and correction
12) Spectacle options for patients with
   a. Photophobia and Glare
   b. Presbyopia
   c. High refractive errors.
   d. Squint and oculo – motor problems.
13) Guidelines for safety standards for spectacles in
   a. Children.
   b. Sports.
   c. Uniocular patient.
14) Industrial safety eye wear.
15) Prescribing for Low Vision
   a. Aids for Distance Vision
   b. Aids for Near Vision
   c. Guide to selecting low vision devices.
   d. Optical devices to help people with field defects.
   e. Non – optical devices.

16) Demonstrating and teaching the patient to use low vision devices.
17) Light, glare and contrast in low vision care and rehabilitation.

Subject code 204 Professional Optometry

PART 1 USE OF COMPUTER TECHOLOGY IN OPTOMETRY

1) Introduction to Computers – hardware and software.
    a. History, Definitions Applications, Advantage, Limitations and types of computers.
    b. System unit – its parts.
    c. RAM, ROM, Keyboard.
    d. Storage devices – floppies, CD ROM drive, other devices.
    e. Monitors and display units, LCD projectors.
    f. Soft ware its evolution and generation, classifications, Application.
2) Introduction to operating systems and basic software use – Microsoft Windows
    a. Features, advantage and types.
    b. Program manager along with menus short cat keys.
    c. Modes of windows, options in dialogue box.
    d. Paint brush, calculator, Clock, Calendar - regional settings.
    e. Control panel and windows programs – write, patient brush.
    f. Printing various types of documents and images.
3) Use of Word processors, Spreadsheet and presentation programs.
    a. MS – Word
        i. Menu bars – file, edit, view, tools, windows, insert.
        ii. Format borders, frame shading handling text, spell check, thesaurus.
        iii. Drawing toolbar, annotations, headers and footers.
        iv. Templates, style, auto save, auto correct, auto format, auto text.
        v. Page set up and printing Mail merge.
    b. MS Excel
        i. Writing formulas and copying hem, auto sum.
        ii. Sorting, drawing tool bar, short cut keys.
        iii. Introduction, features, uses, elements of power point.
        iv. Cursor movement keys short cut keys.
    c. MS Power point
        i. Creating a new presentation.
        ii. Standard and formatting tool bars.
        iii. Adding text in slide view, outline view.
4) Use of database software for clinic records.
5) Use of financial accounting software.
6) Use of personal computers and specialized software in Optometry.
7) Introduction to networking – Local networks, managing networked computers.
8) Internet, the World Wide Web and emails.
    a. Internet browsing, search engines and finding information.
    b. Email and its uses.
    c. Websites related to optometry.

PART 2 **PRACTICE MANAGEMENT**

1) Public Relations – its distinction from publicity, propaganda and advertising.
2) Benefits of public Relations – Image building, promotion of product or services.
3) Public speaking – Microphone technique – Telephone manners.
4) Research in P.R: Opinion and panel research – drawing up of a questionnaire – interpreting the results.
5) Need of customers – efficiency and effectiveness of customers server – feedback and suggestion system.

PART 3 **PROFESSIONAL & BUSINESS ETHICS**

1) Various laws governing medical and Para medical professions in the country.
2) Consumer Act with respect to Optometry and dispensing of Optical aids.
3) Issue pertaining to International and national Optometry.
4) Present rules and regulations – laws regarding Optometry profession, private practice, optical product manufacturing and Optical dispensing in India.
5) Ethics – general and special optometric professional ethics.

PART 4 **FINANCE AND ACCOUNTING MANAGEMENT**

1) Terms used in accounts, Principles of accountancy.
2) Ledger and ledger posting and Tribal balance, Depreciation and other adjustments.
3) Subsidiary books, petty cash book, sales register, purchase register, Stock register.
4) Balance sheet and profit and loss accounts.
5) Income tax and Sales tax laws in our country. (General ideas only)
6) Making a business project report and financial viability of a project.
7) Maintaining accounts for an optometric or optical establishment.