HIMALAYAN UNIVERSITY, ARUNACHAL PRADESH

BACHELOR OF SCIENCE (OPTOMETRY)

(B.Sc - Optometry)

1st YEAR

1st Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	101	Physical and Geometrical Optics (I & II)	30	70	100	40
2	102	General Anatomy & Physiology	30	70	100	40
3	103	Ocular Anatomy & Physiology	30	70	100	40
4	104	Functional English and Communication	30	70	100	40
5	105	Practical (P)	30	70	100	40

2nd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	201	Basic Biochemistry (I & II)	30	70	100	40
2	202	Nutrition	30	70	100	40
3	203	Principles of Lighting	30	70	100	40
4	204	Computing and Computer Applications	30	70	100	40
5	205	Practical (P)	30	70	100	40

2nd YEAR

3rd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	301	Optometric Optics (I & II)	30	70	100	40
2	302	Visual Optics (I & II)	30	70	100	40
3	303	Pharmacology	30	70	100	40
4	304	Marketing and Consumer Behavior	30	70	100	40
5	305	Practical (P)	30	70	100	40

4th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	401	Ocular Diseases (I & II)	30	70	100	40
2	402	Pathology & Microbiology	30	70	100	40
3	403	Clinical Psychology	30	70	100	40
4	404	Optometric Instruments	30	70	100	40
5	405	Clinical Training	30	70	100	40

3rd YEAR

5th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	501	Binocular Vision	30	70	100	40
2	502	Low Vision Aids	30	70	100	40
3	503	Pediatric Optometry & Geriatric Optometry	30	70	100	40
4	504	Law & Occupational Optometry	30	70	100	40
5	505	Practical (P)	30	70	100	40

6th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	601	Glaucoma	30	70	100	40
2	602	Dispensing Optics	30	70	100	40
3	603	Contact Lens	30	70	100	40
4	604	Systemic Diseases	30	70	100	40
5	605	Project Work	30	70	100	40

HIMALAYAN UNIVERSITY, ARUNACHAL PRADESH

BACHELOR OF SCIENCE (OPTOMETRY)

(B.Sc - Optometry)

1st - YEAR

1st -SEMESTER

PHYSICAL AND GEOMETRICAL OPTICS(I&II) (101)

UNIT-1

Light

Nature of light-Newton's Corpuscular theory-Huygens's wave electromagnetic theory-Einstein's quantum theory-Dual Nature theory Properties of light - Spectrum of light Visible light and the eye- Fechner's Law-Weber's law Measurement of light-Radiometry-Photometry

UNIT-2

Interference

Interference phenomena in optics-Constructive interference-Destructive interference Coherence-Spatial coherence-Temporal coherence Applications of interference ThomasYoung's experiment Interference in thin films -Lloyd's single mirror-interference due to reflected and transmitted light Wedge shaped thin films- testing of planeness of surface Newton's rings experiment-refractive index of liquid Non-reflecting films Interferometer-Michelson interferometer-Fabry-Perot interferometer

UNIT-3

Diffraction

Phenomenon of Rectilinear Propagation Frenel's diffraction Fraunhofer diffraction Applied aspects of diffraction Single slit, qualitative and quantitative Zone plate Circular aperture

UNIT-4

Polarisation

Polarization of transverse waves-light as transverse waves Double refraction Nicol prism - Nicol prism as an analyser Elliptically & Circulary polarized light Optical activity- Frenal's experiment Biquartz Applications of polarized light

UNIT-5

Spectrum

Sources of spectrum: Bunsen-carbon-mercury-sodium Emission and absorption spectra Classification of emission spectra Solar spectrum Ultraviolet Spectrum Infra red spectrum Electromagnetic spectrum

UNIT-6

Scattering

Applied aspects-Glare effect-light reduction effect Photo electric effect Raman Effect LASER

UNIT-7

Optical instruments

Spectrometer Simple and compound microscope Telescope Resolving power of optical instruments Resolving power of the eye Magnifying power of simple and compound microscope, telescope

Reference Books:

1. Optics-Hecht (International Edition 4)

2. The principles of Physical optics-Ernst mach

3. Physical optics-S.A. Akhmanov & S.Yu.Nikitin

4. Radiation & Optics – Stone Mc.Graw Hill

5. The eye & visual optical Instruments-George Smith & David Atchison

6. Fundamentals of Optics-Jenkins & White, Mc Graw Hill

7. Principles of Optics-Born & wolf

GEOMETRIC OPTICS I

UNIT-1

Stimulus of vision

Laws of reflection and refraction Total internal reflection The Ray model Fermat's principle

UNIT-2

Refraction through spherical surfaces

Introduction: Lenses-Spherical lens-Cylindrical lens-Contact lens -Divergence and convergence of wave fronts by spherical surfaces - Definition of diaptre -Vergence

Working of spherical lenses – primary and secondary focal points Prism diopter: Prentice's law – deviations- Opthalmic prisms – thin and thick

Refraction at single Spherical or plane surfaces: convex – concave – Curvature & Sagitta-Vergence & dioptric power-Nodal points & nodal ray-lateral magnification and angular magnicifaciton-Snell's law of refraction

Thin lenses: lenses in contact-lenses separated by a distance. Two lens systems- dioptric & vergence power-(Object-image) relationships

Application: calculation of image points - dioptric powers in reduced systems using vergence techniques

Thick lenses –- cardinal points - front and back vertex powers reduced system - dioptric power of equivalent lenses.

Application – to calculate to the equivalent dioptric power of thick meniscus lens-plano convex vertex powers- position of principal planes- Dioptric powers using reduced systems. (Matrix theory and lens matrices)

Cylindrical and spherocylindrical lenses: location of foci-image planes-principle meridians-refraction by a cylindrical lens -calculation of power in different meridians -spherocylindrical lenses- circle of least confusion- refraction through a sphro cylindrical lens- writing Rx in different forms (+cyl., -cyl., meridional)- additional sphro-cylinders-oblique-cylinders

UNIT-3

Stops, Pupils and Ports

Entrance pupil & exit pupil (size & location) Field stopEntrance port & exit port, field of view, vignetting Depth of field and depth of focus

UNIT-4

Aberrations: Spherical Coma Oblique astigmatism Curvature of field Distortion Chromatic

UNIT-5

Thin prisms and Mirrors

Unit of measurement (prism diopter) Prism deviation in prism Combination of thin prisms Dispersive power of prism-achromatic prisms Planar & spherical reflection in mirrors Magnification in mirrors Lens/mirror systems

Reference Books:

Mirrors, Prisms & Lenses-southall, DoverGeometric, Physical & Visual Optics-Michael P.Kealing Aberrations of Optical systems-W.T.Welford Introduction to Geometrical optics-Milton Katz N.Subramanyam & Brij Lal:A text book of Optics, S.Chand & Co.

GEOMETRIC OPTICS II

INTRODUCTION:

1. Vergence and vergence techniques revised. Lens power, prism power, cylindrical lenses

2. Gull strand's schematic eyes, visual acuity, Stile Crawford experiment Errors of refraction:

3. Emmetropia and ammetropia

4. Correction of ammetropia with lenses

5. Myopia

6. Hypermetropia

7. Astigmatism-Causes of Astigmatism-Types of Astigmatism-Application-for eg., to calculate dioptric power - angular magnification of spectacles in aphakic-presbyopic patients

8. Aphakia

9. Presbyopia

10. Thin lens model of the eye – angular magnification – magnification of microscope, telescope, Spectacle and relative spectacle magnification. Applications – To calculate the angular magnification, dioptric power of spectacles, spectacle magnification, entrance and exit pupils, vertex distances

Laser Optics:

11. Laser optics – basic laser principles – spontaneous and stimulated emission. Coherence – spatial, temporal, laser pumping- population inversion optical feedback Gas lasers, solid lasers, helium-neon laser-Argon-ion laser-ruby laser Monocular laser-carbon dioxide, eximer laser - Semiconductor lasers. Lasers in medicine ophthalmic applications

Reference Books:

Lasers –Milonni & Eberly, John wiley & sons

N.Subramanyam & Brij Lal:A text book of Optics, S.Chand & Co.

GENERAL ANATOMY & PHYSIOLOGY (102)

GENERAL ANATOMY

UNIT-1

Introduction:

Subdivisions of Anatomy: Regional and SystemicAnatomy Planes of the Body Terminology

SystemicAnatomy

Skeletal System-Bones of the body Joints – Classification, Joints of the body Muscular system Cardiovascular System- Heart,Arteries & Veins of the Body Lymphatic system – Lymphoid organs, Lymphatics & Lymphatic drainage of the body Respiratory system – Upper and lower Respiratory tract,

Lungs, Pluera & Muscles of Respiration Digestive system Reproductive system Endocrine system Special senses – Ear, Tongue and Nose

UNIT-2

Histology

Ephithelial Tissue Connective Tissue Cartilage Bone Muscular Tissu Cardiovascular Tissue Lymphoid organs Nervous System Skin &Appendages Exocrine glands – Salivary, Lacrimal, Mammary & Pancreas Endocrine glands – Thyroid, Parathyroid, Pituitary &Adrenal Eye – Cornea & Retina

Reference Books:

1. Mariano S.H.Difiore: Atlas of Human Histology, 5th Edn., 1981, Lea & Feliger

2. G.J.Tortora & N.P.Anagnostakos: Principles of Anatomy and Physiology

3. Ross & Wilson, Text Book of Anatomy and Physiology

PHYSIOLOGY

UNIT-1

Introduction to Physiology

Cell structure, Body fluid compartments, Transport across cell membrane, Homeostasis, Skeletal muscle structure and properties, neuromuscular junction and muscle contraction

UNIT-2

Blood

Composition and function of Blood, Red blood cells, erythropoisis, anaemia, White blood cells structure and functions, Platelets and blood coagulation, plasma proteins, blood groups

UNIT-3

Cardiovascular system

Properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, ECG, cardiac output, arterial blood pressure measurement, factors affecting and factor regulating it, heart rate and its regulation

UNIT-4

Respiration

Mechanics of respiration, lung volume and capacities, transport of oxygen and carbondioxide, regulation of respiration, hypoxia and artificial respiration

UNIT-5

Digestive system

Movements of GI tract, Secretions and functions of salivary glands, gastric glands, pancreas, small intestine, function of liver, absorption in the intestine

UNIT-6

Excretion

Structure of Nephron, Renal circulation, formation of urine, micturition, diuretics, normal and abnormal constituents of urine, structure and function of skin

UNIT-7

Endocrine system

All major endocrine glands, their secretion, action and regualtaion with hyper and hypo secretion of the glands.

UNIT-8

Reproductive system

Spermatogenesis, male sex harmones, menstrual cycle, pregnancy and lactation, principles of contraceptive methods

UNIT-9

Nervous system

Structure of neuron, properties of nerve, nerve impulse conduction, synapse, receptor, spinal cord, reflex action, ascending and descending tracts, structure and function of cerebral cortex, basal ganglia, thalamus, hypothalamus, brain stem, sleep and reticular formation, autonomic nervous system

UNIT-10

Special tissues

Olfaction, gustation, Hearing and Vision-Structure, Physiology, pathways and applied aspect

Reference Books:

1. G.J.Tortora & N.P.Anagnostakos: Principles ofAnatomy and Physiology, 4th Edition., Harper & Row Publishers, NY

2. Parthur C. Guyton: Text book of Medical physiology, 8th Ed., Saunder

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OCULAR ANATOMY & PHYSIOLOGY (103)

OCULAR PHYSIOLOGY

UNIT-1

Surface anatomy of the orbit –

Nerve supply & blood supply of Extra-ocular muscles- Neural basis of eye movements – 3rd , 4th , 5th and 6th Cranial nerves – Anatomy of papillary pathway

UNIT-2

Eye Sclera - Anatomy,Anterior &Posterior scleral foramen, Emisaria Cornea – Structure, transparency, nerves, Limbal transition zone

Iris – Structure, Sphincter pupillae, Dilator Pupillae, blood vessels movement of fluid across iris

Ciliary body – Pars plana, pars plicata, blood supply & Nerve supply, Blood supply, accommodation, presbyopia,Aqueous secretion

Retina – anatomy, photoreceptors, general architecture

UNIT-3

Refractive media: Anterior chamber relation, Anterior chamber outflow apparatus, Lens structure, Vitreous gross & microscopic anatomy

UNIT-4

Eyelids: Orbicularis oculli & levator palpebrae superioris, Anatomy blood supply , nerve supply

UNIT-5

Adnexa: Lacrimal apparatus, Embryology and development of eye

Reference Books:

1. Inderbir Singh (I.B.S):AText book of Human Neuro-Anatomy, Vikas Publishing House, 1985

2. A.K.Dutta: Essentials of Human Anatomy, Current books International Calcutta, Bombay, Chennai, 1989

3. Richard S Snell & MA Lemp, OcularAnatomy of the eye, 1998

OCULAR PHYSIOLOGY

Eye lid: Movements and pathways

LacrimalApparatus : Tear film & composition of tears Tests to assess lacrimal excretory function

Extra-ocular muscles : articulation of eyeball in socket Mechanics of movement Control of eye movements Diplopia-Diagnosis & assessment Qualification of extra ocular muscle Limitation (measurement of torsion, measurement of deviation, measurement of field of BSV, measurement of field of muscle action)

Cornea : Biochemistry, Corneal Transparency, Innervations Aqueous Humor & Vitreous:Aqueous secretion & dynamics Maintenance of IOP, Diuranal variations Measurement of IOP Molecular structure of vitreous & developmental anomalies

Crystalline lens &Accommodation: Biochemistry, glucose metabolism Changes in lens structure Depth of field & depth of focus Accommodation (Changes, Amplitude, accomadation & refraction, accomadation & convergence) Presbyopia

Iris & pupil Pupillary reaction to lightMeasurement of afferent papillary defect Pharmacology of pupil Horner's syndrome & evaluation Analyzing anisocoria

Retina : Photichemistry of Retina Wald's visual cycle Entopic phenomenon

Acuity of vision : Vernier acuity, minimum angle of resolution, Principle of measurement, factors affecting visual acuity

Visual pathway : Optic nerve, chiasm & optic tract Visual deprivation, lesions of pathway

Visual Perception : Binocular vision, development, theories of fusion, Stereoscopic acuity, tests for stereopsis, anaomalies of stereopsis, Dark adaption

Colour Vision : Theories of colour vision, Defective colour vision Testing for congenital & acquired colour vision defects

Electrophysiology : Electro retinogram, Electro oculogram

Reference Books:

1. Davson H: Physiology of the eye, 4th edition., 1980

2. Sir Steward Duke Elders, System of Ophthalmology, Vol.4

FUNCTIONAL ENGLISH AND COMMUNICATION (104)

FUNCTIONAL ENGLISH

UNIT-1

Grammar

Components of a sentence Positive and Negative statements Interrogative Statement Parts of speech in brief Transformation and synthesis of sentences Verb and Tense forms Voice Reported Speech Common errors and how to avoid them

UNIT-2

Vocabulary

Medical Terminology Words often confused or misused Words and expression in British and American English Idioms and Phrases

UNIT-3

Oral communication

Importance of speaking efficiently Voice culture Preparation of Speech Secrets of good delivery Audience Psychology Presentation Skills Using non-verbal communication Interview techniqueSkill in arguing

UNIT-4

Spoken English

The phonetic symbols Stress Intonation Rhythm Transcription Using dictionaries for learning to pronounce

UNIT-5

Written communication

(a) Art of writing

Rules for effective writing Expansion of proverbs & Ideas Précis writing

(b) Letter writing

Private letters & Social letters Business letters Letter to a Bank Letter to a Newspaper Letter toApplication Curriculum Vitae (Different models) Placing an order

(c) Report writing

Guidelines to prepare a good report Usage of impersonal language Preparing lab reports

(d) Note making and Note taking

Note making and note taking strategies Organizing notes Exercise and note making / taking (e) Comprehension Listening and reading comprehension (Exercise of prescribed short answers)

UNIT-6

Reading

(a) What is efficient and fast reading?

(b) Awareness of existing reading habits

(c) Tested techniques for improving speed

(d) Improving concentration and comprehension through systematic study

Reference Books:

1. English for Competitive Examinations by R.P.Bhatnagar, Rajiel Bhargava

2. English for college and competitive exams by Dyvadatham

3. Written Communication in English by Sarah Freeman

4. Writing with a purpose by Tickoo & Sasikumar

5. English phonetics for Beginners by P.Iyadurai

6. English through reading byW.Bhaskar and N.S.Prabhu

7. Empowerment through verbs & idioms by Padmini devkumar

8. High School English Grammer and Composition by Wren & Martin

9. Communication techniques for your success everywhere by Muralidharan

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PRACTICAL (P) (105)

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1st – YEAR

2nd -SEMESTER

BASIC BIOCHEMISTRY (I&II) (201)

UNIT-1

Carbohydrates

Properties of monosaccharide, disaccharides, polysaccharides and their biological importance

UNIT-2

Proteins

Classification and properties of Amino acids, physiological important peptides, Classification and properties of proteins, plasma proteins, structure of protein, immunoglobulins, chromatography and electrophoresis

UNIT-3

Lipids

Classification and properties of fatty acids, triglycerides, phospholipids, other compound lipids, cholesterol its derivatives and their biological significance

UNIT-4

Enzymes

Definition, classification, co-enzymes, factors affecting their action, enzyme inhibition, enzymes of clinical importance

UNIT-5

Vitamins

Classification, functions, source, deficiency manifestations and hypervitaminoses. Minerals Calcium, Phosphorus, Sodium, Potassium, iron, selenium, iodine, copper

Reference Books:

1. Dr.S.Ramakrishnan: Essentials of Biochemistry & Ocular Biochemistry 1992, Publications Division, Annamalai University. (EBO)

2. G.Rajagopal & Dr.S.Ramakrishnan: Practical Biochemistry for Medical students, M/s. Orient Longman, Calcutta, 1985

BASIC BIOCHEMISTRY (II)

UNIT-1

Hormones basic concepts in metabolic regulation with examples, with respect to insulin

UNIT-2

Metabolism

Metabolism of carbohydrates, proteins and lipids

UNIT-3

Ocular Biochemistry

Various aspects of the eye, viz., tears, cornea, lens, aqueous, vitreous, retina and pigment rhodopsin.

Importance of the biochemical constituents in ocular tissues

UNIT-4

Technique

Colloidal state, sol. Gel, emulsion, dialysis, electrophoresis, Ph buffers mode of buffer action, molar and percentage solutions, photometer, colorimetry and spectrophotometry Radio isotopes: application in medicine and basic research

UNIT-5

Clinical Biochemistry

Blood sugar, urea, creatinine and bilirubin significance of their estimation

Reference Books:

1. Dr.S.Ramakrishnan: Essentials of Biochemistry & Ocular Biochemistry 1992, Publications Division, Annamalai University. (EBO)

2. G.Rajagopal & Dr.S.Ramakrishnan: Practical Biochemistry for Medical students, M/s. Orient Longman, Calcutta, 1985

NUTRITION (202)

UNIT-1

Introduction

History of nutrition, Nutrition as science

UNIT-2

Foods

Food groups, RDA, Food guides, Food Pyramid, Balanced diet, Limitations of daily food guide, Menu planning

UNIT-3

Carbohydrates

Function, sources, RDA, Dietary fiber

UNIT-4

Proteins

Sources and functions, Essential and non-essential amino acids, Incomplete and complete proteins, Supplementary food, PEM and the eye, Nitrogen balance, Changes in the protein requirement

UNIT-5

Fats

Functions and sources, Essential fatty acids, Excess and deficiency, Lipids and the eye

UNIT-6

Energy

Units of energy, Measurement and energy value of food, Energy expenditure, Total energy/calorie requirement for different age groups and diseases, Energy imbalance – obesity, starvation

UNIT-7

Minerals

General functions and sources, Macro and micro minerals associated with the eye, Deficiencies and excess – ophthalmic complications (e.g) Iron, calcium, Iodine, etc

UNIT-8

Vitamins

General functions, food sources, Vitamin deficiencies and associated eye disorders with particular emphasis on vitamin 'A'

UNIT-9

Antioxidant

Lutein, xeamanthin, lycopene, Monosodium Glutamate, aspartame and their role in vision

Reference Books:

1. Nutritional Opthalmology (Nutrition, Basic and Applied Science) by Donald Stewart MC Lenon, 2nd Ed. (1980)
2. Nutritional and environmental influences on the Eye,Allen Taylor (1999)
3. NutritionalAspects and Clinical Management of Chronic Disorders and Disease (2002)
4. Normal and Therapeutic Nutrition, Orinne H. Robinson & Narilyn R. Lawler, 1986
5. Food & Nutrition, Dr. M.Swaminathan, Vol. I & II

PRINCIPLES OF LIGHTING (203)

UNIT-1

Modern theory on light and colour: synthesis of light

UNIT-2

Colour theory: Additive and subtractive synthesis of colour- Goethe's theory 7 reasoning – colour temperature-colour rendering

UNIT-3

Visual task: factors affecting visual tasks

UNIT-4

Light and vision : Discomfort glare - Visual ability- relationship among lighting- visibility and task performance

UNIT-6

Light sources: Sunlight-Modern light sources – spectral energy distribution – luminous efficiency – colour temperature – colour rendering.

UNIT-6

Illumination : Luminous flux, candela, solid angle, illumination, utilization factor, depreciation factor, Illumination laws

UNIT-7

Lighting System Design : Design approach, Design process, concept of lighting design, Physical consideration and psychological consideration and types of lighting

UNIT-8

Photometry : Photometric quantities - photometers and filters

UNIT-9

Fibre optics: Optical description-optical fiber communication -optical fibre cables.

Reference Books:

Colour:An introduction to practice and principles Applied Illumination Engineering-Lindsey

Illuminating Engineering Society of North America Introductory Lighting, 1985

COMPUTING AND COMPUTER APPLICATIONS (204)

UNIT-1

Computers: History of computers, Definition of computers, input devices, output devices, storage devices, types of memory, and units of measurement, range of computers, generations of computers, characteristics of computers,.

UNIT-2

System: Hardware, Software, system definition, Fundamentals of Networking, Internet, performing searches and working with search engines, types of software and its applications

UNIT-3

Office application suite – Word processor, spreadsheet, presentations, other utility tools, Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

Language - Comparison chart of conventional language, programming languages, generations of programming languages, Compilers and interpreters, Universal programming constructs based on SDLC, Variable, constant, identifiers, functions, procedures, if while, do – while, for and other Structures. Programming in C language, Data types, identifiers, functions and its types, arrays, union, structures and pointers

Introduction to object oriented programming with c++: classes, objects, inheritance polymorphism, and encapsulation. Introduction to databases, and query languages, Introduction to Bioinformatics

Reference Books:

1. C Programming Tutorial (K & R version 4) Author(s): Mark Burgess

2. An introduction to GCC by Brain J.Gough, foreword by Richard M.Stallman

3. Red Hat Linux 9 bible by Christopher Negus May 2003

4. Microsoft office 2003 by Jennifer Ackerman Kettell, Guy Hart-Davis

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PRACTICAL (P) (205)

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2nd - YEAR

3rd –SEMESTER

OPTOMETRIC OPTICS (I&II) (301)

OPTOMETRIC OPTICS I

UNIT-1

Spectacle lenses:

Introduction to spectacle lenses Forms of lenses Cylindrical and spherocylindrical lenses Properties of crossed cylinders Toric lenses Toric transportation Astigmatic lense Axis direction of astigmatic lenses Obliquely crossed cylindersSag formula Miscellaneous spectacle lenses Vertex distance and vertex power Tilt induced powerAberrations in ophthalmic lenses Fresnel prisms, lenses and magnifiers

Part II

UNIT-2

Spectacle lenses:

Manufacture of glass Lens surfacingPrinciple of surface generation and glass cements Lens quality Faults in lens material Faults on lens surface Inspecting the quality of lenses Toughened lenses

UNIT-3

Ophthalmic lenses

Definition of prisms; units of prism power Thickness difference and base – apex notation Dividing, compounding and resolving prisms Rotary prisms and effective prism power in near vision Prismatic effect, decentration, Prentice's rule Prismatic effect of spherocylinders and plano cylinders Differential prismatic effects

UNIT-4

Spectacle frames

Frame types and parts Classification of spectacle frames – material, weight, temple position, coloration Frame construction, frame measurements and markings

Reference Books:

M.Jalie: Principles of Ophthalmic Lenses, Edition 3, 1980 T E Fannin & T Grosvenor: Clinical Optics,1996

OPTOMETRIC OPTICS II

1. Tinted and protective lenses
2. Characteristics of tinted lenses
3. Absorptive glasses
4. Polarizing filters
5. Photochromic filters
6. Reflecting filters
7. Bifocal lenses
8. Trifocal lenses
9. Progressive addition lenses
10. Lenticular lenses
11. Reflections from spectacle lenses, ghost images, reflections in bifocals at the dividing line
12. Anti-reflection coating, Anti-scratch coating,Anti-fog coating, Mirror coating, Edge coating, hard multi

coating (HMC)

13. Field of view of lenses

14. Size, shape and mounting of ophthalmic lenses

15. Aspherical lenses

Reference Books:

1. M.Jalie: Principles of Ophthalmic Lenses, Edition 3, 1980 2. T E Fannin & T Grosvenor: Clinical Optics,1996

VISUAL OPTICS (I&II) (302)

VISUAL OPTICS I

UNIT-1

Review of Geometric Optics Vergence and power Conjugacy, object space and image space Sign conventionSpherical refracting surface Spherical mirror; catoptric power Cardinal points Magnification

Optics of Ocular Structures Cornea and aqueous Crystalline lens Vitreous

Curvature of the lens and opthalmophakometry Axial and axis of the eye

Measurement of the optical constants of the eye Corneal curvature and thickness Keratometry Curvature of the lens and ophthalmophakometry Axial and axis of the eye

UNIT-2

Refractive anomalies and their causes Aeitology of refractive anomalies Contributing variabilities and their ranges Populating distributions of anomalies Optical component measurements Growth of the eye in relation to refractive errors

Reference Books:

1. Bennett & Rabbetts: Clinical visual Optics

2. David O Michaels: Visual Optics & Refraction (DOM)

VISUAL OPTICS II

UNIT-1

Refractive conditions Emmetropia

Myopia Hyperopia Astigmatis Anisometropia and Anisekonia Presbyopia Aphakia and Pseudo aphakia

Correction and Management of Ambiopia

UNIT-2

Far and near points of accommodation Correction of spherical ametropis Axial versus refractive ametropia

Relationship between accommodation and convergence;A/c ratio

UNIT-3

Retinoscopy – principles and methods

Retinoscopy – speed of reflex and optimum condition Retinoscopy – dynamic/static Review of objective refractive methods Review o f subjective refractive methods Cross cylinder method for astigmatism, Astigmatic Fan test Difficulties in objective tests and their avoidance Transposition of lenses Spherical equivalent Prescribing prisms Binocular refraction

UNIT-4

Effective power of spectacles; vertex distance effects Ocular refraction versus spectacle refraction Ocular accommodation versus spectacle accommodation Spectacle magnification and relative spectacle magnification Retinal image blur; depth of focus and depth of field

Reference Books:

1. Abrams D: Duke elders Practice of Refraction, Edition 9, 1998

PHARMACOLOGY (303)

UNIT-1

General Pharmacology

Introduction, sources of drugs, drug formulations in ophthalmic use General routes of drug administrations, ocular routes Pharmacokinetics - absorption, distribution, Bio-transformation, excretion of drugs Pharmacokinetics - Factors modifying drug action Adverse drug effects

UNIT-2

Autonomic Nervous system

Cholinergic drugs Anticholinergic drugs Sympathomimetics Anti adrenetgic drugs Anti glaucoma drugs

UNIT-3

Peripheral Nervous system

Local anaestheticsDifferent techniques of giving LA in eye

UNIT-4

Autocoids

Antihistamines mast cell stabilizers, Mucolytics Non steroidal anti-inflammatory drugs

UNIT-5

Hormones

Insulin and oral hypoglycaemic drugs Corticosteroids

UNIT-6

Central Nervous system

GeneralAnaesthesia Ethyl and Methyl alcohol Sedatives and hypnotics Antidepressants

UNIT-7

Cardiovascular system

Anti hypertensives DiureticsCoagulants and anticoagulants

UNIT-8

Chemotherapy

Antibiotics – Sulfonamides, Quinolones, Blactam antibiotics, Tetra cyclones, Chloram phenicol, amino glycosides, macrolides Anti tubercular drugs Anti leprotic drugs Anti fungal drugs Anti viral drugs

UNIT-9

Miscellaneous

Anticancer drugs for ophthalmic use Immunosuppressants Drugs acting on skin and mucous membranes Antiseptics and disinfectants Vitamins Drugs causing ocular toxicity Drugs and Biological agents used in Opthalmic surgery Agents used to assist in ocular diagnosis Wetting agents/ Tear substitutes/ Osmotic drugs in ocular use

Reference Books:

1. S P Rang, M M Dale, Ritter- Pharmacology Edition 3, Churchill 1995

2. K D Tripathi: Essentials of Medical Pharmacology, 4th Ed., 1999

3. Goodman & Gilman's the pharmacological basis of therapeutics, 11th edition

Books suggested for reading

1. Text book of pharmacology by Seth 2nd edition

2. Basic and clinical pharmacology by Katzung 9th edition

MARKETING AND CONSUMER BEHAVIOR (304)

UNIT-1

Market-Classification of markets- Marketing

Features of marketing-Scope of marketing-Importance of marketing- Marketing and Selling-Role of marketing in Economic Development

UNIT-2

Marketing mix-Product-Features-Classification-Product mix-

Product Differentiation-Branding and packaging-Price-Importance of pricing-Pricing objectives-Factors affecting pricing decisions-Procedure for price determination-Kinds of pricing-Sales promotion-Purpose-Kinds of sales promotion-Consumer promotion-Dealer promotion-Advertising

UNIT-3

Marketing Finance-Finance-Business Finance-Fixed and working capital-

Factors determining working capital-Types and sources working capital –Trade credit-Consumer credit

UNIT-4

Consumer Behaviour-Introduction-Buying motives

Buying decision Process-factors influencing buying behaviour-Customer retention-Need-Importance-Advantages-Customer Relationship Management (CRM)

Reference Books

1. Marketing Management-analysis, planning and control – Philip Kotler, (1987), 11th edition, Prentice hall of India, New Delhi

2. Principles of Marketing-Philip Kotler & Gary Armstrong (1996), Prentice Hall of India, New Delhi 14th Indian reprint

3. The essence of Marketing- Simon Majoro, (1996), 3rd Indian Reprint, Prentice Hall of India, New Delhi

4. Fundamentals of Marketing – William J.Stanton and Charles Futrell

5. Marketing Management – Rajan Saxena

6. Consumer Behaviour, Leon G.Schiffman, Leslie Lazar Kanuk, 6th Edition Prentice Hall of India, New Delhi.

PRACTICAL (P) (305)

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2nd - YEAR

4th –SEMESTER

OCULAR DISEASES (I&II) (401)

OCULAR DISEASES I

UNIT-1

Eyelids:

Eyelid anatomyCongenital and developmental anomalies of the eyelids Blepharospasm Ectropion EntropionTrichiasis and symblepharon Eyelid inflammations Eyelid tumours Ptosis Eyelid retraction Eyelid trauma

UNIT-2

Lacrimal system

Lacrimal system Lacrimal pump Methods of lacrimal evaluation Congenitial and development anomalies of the lacrimal system Lacrimal obstruction Lacrimal sac tumors Lacrimal trauma

UNIT-3

Sclera

Episclera Ectasia and staphyloma Scleritis, episcleritis

UNI-4

Orbit

Orbital anatomy Incidence of orbital abnormalities Methods of orbital examination Congenital and developmental anomalies of theorbit Orbital tumours Orbital inflammations Sinus disorders affecting the orbit Orbital trauma

UNIT-5

Conjunctiva and Cornea Inflammation

Therapeutic principles Specific inflammatory diseases Tumours Tumours of epithelial origina Glandular and adnexal tumours Tumours of neuroectodermal origin Vascular tumours Xanthomatuos lesions Inflammatory lesions Metastatic tumours Degenerations and dystrophies Definitions Degenerations Dynstrophies Miscellaneous conditions Keratoconjuctivitis Sicca (K Sicca)

Tear function tests

Stevens – Johnson syndrome Ocular Rosacea Atopic eye disorders Benign mucosal pemphigoid (BMP) – ocular pemphigoid VitaminA deficiency Metabolic diseases associated with corneal charges

UNIT-6

Iris, Ciliary body and Pupil Congenital anomalies Primary and secondary disease of iris and ciliary body Tumors Anomalies of papillary reactions

UNIT-7

Choroid

Congential anomalies of the choroids Diseases of the choroid Tumours

Reference Books:

Jack J. Kanski: Clinical Opthalmology, Butterworths, 2nd Ed., 1989

OCULAR DISEASES II

UNIT-1

Vitreous

Developmental abnormalities Hereditary hyaloidoretinopathies Juvenile retinoschisis Asteroid hyalosis Cholesterolosis Vitreous haemorrhage Blunt trauma and the vitreous Inflammation and the vitreous Parasitic infestations Pigment granules in the vitreous Vitreous complications in cataract surgery

UNIT-2

Retina

Retinal vascular diseases Diseases of the choroidal vasculature, Bruch's membrane and retinal pigment epithelium (RPE) Retinal tumors Retinoblastoma Phakomatoses Retinal vascular anomalies Retinal and optic nerve head astocytomas Lymphoid tumor Tumors of the retinal pigment epithelium Other retinal disorders Retinal inflammations Metabolic diseases affecting the retina Miscellaneous disorders Electromagnetic radiation effects on the retina Retinal physiology and psychophysics Hereditary macular disorders (including albinism) Peripheral retinal degenerations Retinal holes and detachments Intraocular foreign bodies Photocoagulation

UNIT-3

Neuro-ophthalmology

Neuro-ophthalmic examination History Visual function testing Technique of papillary examination Ocular motility Checklist for testing Visual sensory system The retina The optic disc The optic nerve The optic chiasm The optic tracts The lateral geneculate body The optic radiations The visual cortex The visual field

The blood supply of the anterior and posterior visual systems Disorders of visual integration Ocular motor system Supranuclear control of eye movements

- Saccadic system
- Clinical disorders of the saccadic system
- Gaze palsies
- Progressive supranuclear palsy
- Parkinson's disease
- Ocular motor apraxia
- Ocular oscillation

Smooth pursuit system and disorders Vergence system Cerebella system Non-visual reflex system Position maintenance system Nystagmus Ocular motor nerves and medial longitudinal fascicules The facial nerve Pain and sensation from the eye Autonomic nervous system Selected systemic disorders with neuro-ophthalmologic signs

UNIT-4

Lens

Anatomy and pathophysiology Normal anatomy and aging process Developmental defects Acquired lenticular defects

UNIT-5

Trauma

Anterior segment trauma Posterior segment trauma

UNIT-6

Blindness

Blindness – definitions Causes 6.1.2 Social implications 6.1.3 Rationale in therapy Drug induced ocular diseases

Reference Books:

1. Jack J. Kanski: Clinical Opthalmology, Butterworths, 2nd Ed., 1989

PATHOLOGY & MICROBIOLOGY (402)

PATHOLOGY

1. General Introduction

2. Inflammation and repair

3. Ophthalmic wound healing

4. Infections (tuberculosis, leprosy, syphilis, fungus, virus, Chlamydia)

5. Intraocular tumours (retinoblastoma, choroidal melanoma)

6. Optic nerve (normal and tumors)

7. Hematology (anemia, Leukemia and bleeding disorders)

8. Clinical pathology (examination of urine and blood smears)

9. Eyelid (normal and pathology including inflammations and tumors)

10. Cornea (normal and pathology in degeneration and dystrophies)

11. Lens (normal and pathology of cataract)

12. Retina (normal and pathology in inflammatory disease, infections)

13. Orbit (inflammation and neoplasia)

MICROBIOLOGY

1. Morphology of the bacterial cell
2. Growth and nutrition of bacteria; cultivation methods
3. Identification of Bacteria
4. Sterilization
5. Disinfection
6. Antibacterial agents and antibiotic sensitivity testing
7. Basic Immunology
8. Bacterial infections of the eye
9. Viral infections of the eye
10. Parasitic infections of the eye
11. Fungal infections of the eye

Reference Books:

1. Corton Kumar and Robins: Pathological Basis of the Disease, 4th edition, 1994

2. Harsh Mohan: Text Book of Pathology

3. Burton G R W: Microbiology for the Health Sciences, St.Louis, J P Lippincott Co., 3rd ., 1988

4. Essentials of Medical Microbiology by Rajesh Bhatia, Rattan Lal Ichhpujani- Jaypee (latest edition)

CLINICAL PSYCHOLOGY (403)

UNIT—1

Introduction to Psychology A – Definition, History, Branches, Scope and Current Status B – Methods, Concepts of Normality and abnormality

UNIT-2

Sensation, Attention and Perception Primary senses

Types of attention and determinants Principles of perception and determinants

UNIT-3

A – Intelligence, B - Learning, C - Memory, D - Personality, E – Motivation and F – Body image and personality integration

UNIT-4

Helper

Helpee relationship and Ophthalmic counseling Characteristics of therapist, Relationship between the therapist and client Counseling patient with partial sight, colour blindness and hereditary vision defects

UNIT-5

Psychological Reaction

A – Illness, loss and Grief

B - Adapting changes in Vision (age, diseases, etc….)

UNIT-6

Tests for people with disability

WAIS – R, WISC –R (for visually handicapped) Blind learning aptitude tests

UNIT-7

Disability and Rehabilitation

Reference Books:

1. Introduction to Psychology, Morgon C.T., King R.A., Robinson N.M., Tata Mc Graw Hill Publishing Co.

2. Introduction to Psychology, Hilgard and Atkinson, Tata Mc Graw Hill Publishing Co.

3. Psychology 5th Ed. Dworetsky J.P.

4. Child Development Hurlock, EB, VIED, Mc Graw Hill International Book Co. (1981)

OPTOMETRIC INSTRUMENTS (404)

1. Binocular vision

2. Simple and compound microscope – oil immersion eyepiece

3. Refractive instruments: Test chart standards Choice of test charts Trial case lenses – best forms Refractor (phoropter) head units –Auto refractors Optical considerations of refractor units Trial frame design Near vision difficulties with units and trail frame Retinoscope – types available Adjustment of retinoscopes – special features Cylinder retinoscopy The interpretation of objective findings Special subjective test – polarizing and displacement – etc., simultan test Projection charts Illumination of the consulting room Special Instruments: Brightness acuity test Vision analyzer Pupilometer Video acuity test Nerve fiber analyzer

4. Opthalmoscopes and related devices Design of opthalmoscopes – illumination/viewing Opthalmoscope disc Filters for opthalmoscopy Indirect opthalmloscopes The use of the opthalmoscope in special cases

5. Lensometer, lens gauge or clock

6. Slit lamp Slit lamp systems Viewing microscope systems Scanning laser devices Slit lamp accessories Mechanical design in instruments

7. Tonometer Tonometer principles Types of tonometers and standardization Use and interpretation of

tonometers

8. Fundus camera The fundus camera - principles The fundus camera – techniques External eye photography – apparatus

9. Keratometer and corneal topography

10. Refractionometer

11. Orthoptic Instruments Orthoptic Instruments - haploscopes Orthoptic Instruments – home devices Orthoptic Instruments – pleoptics Historical instruments

12. Colour vision testing devices Colour confusion/Hue discrimination/Colour matching FM-100 hue test

13. Fields of vision and screening devices Perimeter and the visual field Illumination of field testing instruments Projection perimeters Screening devices for field defects Results of field examination Vision screeners – principles Vision screeners – details Analysis of screener results Bowl perimeters Goldmann and Humphery VisionAnalyzer

14. Optical devices and electronic (Low vision) aids

15. Ophthalmic Ultrasonography Biometry/Ultrasound/'A' Scan/'B' Scan/UBM

16. Electrodiagnostics ERG/VEP//EOG

17. NFA

Reference Books:

1. David B Henson: Optometric Instrumentation. (DBH)

CLINICAL TRAINING (405)

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2nd - YEAR

5th –SEMESTER

BINOCULAR VISION (501)

1. Spatial sense
2. Evolution of Binocular vision
3. Binocular fusion, suppression, revalry and summation
4. Visual direction, local sign and corresponding points
5. Visual distance, empirical cues
6. Panum's space
7. Stereopsis
8. Development of Binocular vision
9. The longitudinal horopter
10 Neural aspects of Binocular vision
11. Visually guided behaviour and aniselkonia
12. ARC
13. Qualitative and quantitative diagnosis of strabismus
14. Esodeviations
15. Exodeviations
16. A-V phenomena
17. Cyclovertical squint

18. Pseudo strabismus

19. Amblyopia and eccentric fixation

20. Treatment of amblyopia

21. Special forms of strabismus

22. Nystagmus

23. Non-surgical management of strabismus

24. Review of orthoptic procedures

Reference Books:

1. R W Reading: Binocular Vision- Foundations and Applications

2. Basic Science, A.A.O (section-6) Pediatric Ophthalmology and Strabismus 1992-1993

LOW VISION AIDS (502)

1. Identifying the low vision patient

2. History

3. Diagnostic procedures in low vision case management

4. Optics of low vision aids

5. Refraction, special charts.l Radical retinoscopy

6. Evaluating near vision:Amsier grid and field defects, prismatic scanning

7. Demonstrating aids – optical, Non-optical, Electronic

8. Teaching the patient to use aids including eccentric viewing training when necessary

9. Guidelines to determining magnification and selecting low vision aids for distance, intermediate and near

10. Spectacle mounted telescopes and microscopes

11. Children with low vision

12. Choice of tests, aids in different pathological conditions

13. Light, glare and contrast in low vision care and rehabilitation

14. Bioptic telescopes

15. Optical devices to help people with field defects

16. Contact lens combined system

17. Rehabilitation of the Visually handicapped

Reference Books:

1. C.Dickinson : Principles and Practice of Low Vision, Butterworth- Heinemann Publication, 1998

PEDIATRIC OPTOMETRY & GERIATRIC OPTOMETRY (503)

PAEDIATRIC OPTOMETRY

PART I – Examination and Diagnosis

1. History

Genetic factors - Perinatal factors- Prenatal factors - Postnatal factors Measurement of visual acuity

2. Normal appearance, Pathology and structural anomalies of :

Orbit Eyelids Lacrimal system Conjunctiva Cornea Sclera Anterior chamber, uveal tract, pupils Lens, vitreous, fundus Oculomotor system

3. Measurement of refractive status

4. Determining binocular status

5. Determining sensory motor adaptability

PART II – Post-Examination process

6. Compensatory treatment and remedial therapy for: Myopia Pseudo myopis Hyperopia Astigmatism Anisometropis Amblyopia

7. Remedial and compensatory treatment for strabismus and nystagmus

8. Vergence and accommodation

GERIATRIC OPTOMETRY

1. Structural changes in eye

2. Physiological changes in eye

3. Optical and refractive changes in eye

4. Aphakia, Pseudo aphakia – its correction

5. Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders,

vascular diseases of the eye

6. Special considerations in ophthalmic dispensing to the elderly

7. Management of visual problems of aging

8. How to carry on one's visual task overcoming the problems of aging?

Reference Books:

1. Jerome Rosner: Pediatric Optometry, Butterworths, London, 1982

2. Hirsch M J & Wick R E: Vision of theAging Patient,An Optometric Symposium, 1960

LAW & OCCUPATIONAL OPTOMETRY (504)

LAW & OPTOMETRY

1. Legal environment and techniques – history – law and equity

2. History and theory of licensure

3. Licensure as a means of internal and external discipline – unprofessional conduct – incompetence – gross

immorality

4. International Optometry – important foreign optometry law

5.The Optometrist in court

6. Malpractice – Theory of Liability – damages – minimizing malpractice claims

7.Insurance

8.Negligence

9.Ethics – professional ethics

10.Laws governing practice of medical profession and para-medical profession In India

11.Registered medical practitioner – laws against practice of medicine of those unregistered – Medical Council of India – Dental Council – Nursing council

12. Present rules and regulations – Laws regarding optical product manufacturers – dispensing in India

13. Opticians – Are they registered? Dispensing Opticians – rules in U.K

OCCUPATIONAL OPTOMETRY

1. Introduction to occupational health, hygiene and safety International Bodies like ILO, WHO, National bodies like labour Institutes, National Institutes of Occupational Health, National Safety Council, etc.

2. Acts and Rules: FactoriesAct and Rules- Workmen's CompensationAct – ESI Act, etc

3. Occupational diseases/ occupation related diseases caused by – physical agents, chemical agents and biological agents

4. Occupational hygiene, environmental monitoring Recognition, evaluation and control of hazards Illumination – definition, measurements and standards

5. Occupational safety Causes of accidents Vision, lighting, colour and their role Accident analysis Accident prevention

6. Ocular and visual problems of occupation Electromagnetic radiation Ionizing Non-ionizing – Infra red Ultra violet Microwave, Laser Injuries – Mechanical, chemical Toxicology – Metals, chemicals

7. Prevention of occupational diseases Medical examination / medical monitoring Pre-employment / pre- Placement Periodic

8. Personal protective equipment General Goggles, face shields, etc Selection and use Testing for standards

9. Standards Visual standards for jobs

10. Problems of special occupational groups Drivers, Pilots and others

11. Field work – submission of reports Visits to : Regional Labour Institute, selected industries

12. Visual display units (terminals) - -VDU/VDT Contact lens and work Pesticides – general and visual and ocular defects

13. Role of Optometrists – promotion of general and visual health and safety of people at work

Reference Books:

1. Seymour L Coblens: ptometry and the Law, American OptometricAssociation, St.Louis,1976

2. R.A.F. Cox (ed.) fitness for work – the medical aspects. Oxford University Press 2000, reprinted 2003

3. Indian Association of Occupation Health, Guidelines on Pre-Employment Medical Examination, Pune 1998

4. BarbaraA.Plog, Patrica J. Quinlan. Fundamentals of Industrial Hygiene. 5th Edition, 2002

5. John Ridley & John Channing. Safety at work. 5th Edition 1999, reprinted 2000,2001

6. Stephen Konz, Steven Johnson. Work Design-Industrial Ergonomics 2000

7. Salvatore R. Dinardi. The Occupational Environment – Its Evaluation and Control 1997

8. Linda Rosenstock & Mark R.Cullen. Textbook of Clinical Occupational and Environmental Medicine, 1994

9. William N. Rom. Environmental and Occupational Medicine. 3rd edition, 1998

10. Stephen L.Demeter, Gunnar B. J.Andersson. Disability Evaluation. 2nd edition, 2003

PRACTICAL (P) (505)

2nd - YEAR

6th –SEMESTER

GLAUCOMA (601)

1 Introduction to glaucoma

a. Epidemiology

b. Heridity

c. Definition & classification of Glaucoma

2. Intra Ocular pressure and Aqueous humor dynamics

3. Clinical Evaluation

a. History and General examination

b. Gonioscopy

c. Optic nerve head analysis

d. Visual fields

4.Childhood Glaucoma

5.Open angle glaucoma

a. The glaucoma suspect

b. Open angle glaucoma without elevated IOP

c. primary open angle glaucoma

d. Secondary open angle glaucoma

6. Angle closure glaucoma

a. Primary angle closure glaucoma

b. Secondary angle closure glaucoma

7. Medical management of glaucoma

8. Surgery therapy f or glaucoma

9. Newer advances in the management of glaucoma

Reference Books:

1. M Bruce Shields (MBS): Text Book of Glaucoma, Williams & Wilkins, London

2. Marc Leiberman: Simplified Guide to Computerized Perimetry

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DISPENSING OPTICS (602)

1. Clinical experiences in verification and dispensing of ophthalmic materials outlined in Ophthalmic Optics.(Optometric Optics)Course and Dispensing Optics

2. Special practical instructions in centering, marking and mounting the lenses of all designs, types, shapes and sizes in accordance with frame and facial measurements

3. Visit to lens manufacturing workshops

4. Video session on fitting of progressive lenses

5. ANSI standards

6. Dispensing Instrumentation Pupillometer Pliers PCD Air blower Distometer

7. Abbe's value, specific gravity, optical density, Pantoscopic flit

8. Patients selection, fitting Ms of PALs, Selection of designs

9. case study : problems, orientated dispensing optics

10. Recent developments

11. Special purpose frames

12. Safety wear

Reference Books:

1. Clifford W Brooks & Irvin M Borish: System of Ophthalmic Dispensing, Professional press, 1979

CONTACT LENS (603)

1. History of contact lens
2. CornealAnatomy and Physiology
3. Corneal Physiology and Contact Lens
4. Preliminary Measurements and Investigations
5. Slit lamp Biomicroscopy
6. Contact lens materials
7. Optics of Contact lenses
8. Glossary of Terms: Contact Lenses
9. Indications and Contra Indications of CL
10. Rigid gas permeable contact lens design
11. Soft contact lens design
12. Keratometry, Placido's disc, Topography
13. Fitting philosophies (Introduction to Contact lens fitting)
14. Handling of contact lenses
15. Fitting of spherical Soft CL and effects of parameter changes
16. Astigmatism; Correction options
17. Fitting spherical RGP CL. Low DK High DK
18. Effects of RGP CL parameter changes on lens fitting
19. Fitting in Astigmatism
20. Fitting in Keratoconus
21. Fitting in Aphakia, Pseudophakia
22. Lens care & Hygiene Instructions Compliance
23. Follow up post fitting examination

24. Follow up slit lamp examinations

25. Cosmetic Contact lenses

26. Fitting contact lens in children

27. Toric Contact lenses

28. Bifocal contact lenses

29. Continuous wear and extended wear lenses

30. Therapeutic lenses / bandage lenses

31. Contact lens following ocular surgeries

32. Disposable contact lenses, Frequent replacement and lenses

33. Use of Specular Microscopy and Tachymetry in CL

34. Care of contact lenses, Contact lens solutions

35. Complications of Contact lenses

36. Contact lens modification of finished lenses

37. Instrumentation in contact lens practice

38. Checking finished lens parameters

39. Contact lens – Special purposes – Swimming, Sports, Occupational etc.,

40. recent developments in Contact lenses

41. Review of lenses available in India

42. Current contact lens research

Reference Books:

1. Robber B Mandell: Contact lens Practice, hard and flexible lenses, Charles C. Thomas, 3rd Edition,

1981, Illinois, USA

2. Ruben M Guillon: Contact lens practice, 994, 1st Edition

SYSTEMIC DIEASES (604)

UNIT-1

Arterial Hypertension

Pathophysiology, classification, clinical examination, diagnosis, complications, management Hypertension and the eye

UNIT-2

Diabetes Mellitus

Pathology, classification, clinical features, diagnosis, complications and management Diabetes mellitus and the eye

UNIT-3

Acquired Heart Disease

Embolism Rheumatic fever- Pathophysiology, classifications, diagnosis, complications, management Embolism Subacute bacterial endocarditis

UNIT-4

Cancer – Introduction

Definitions, nomenclature, characteristics of Benign and malignant neoplasms Grading of staging of cancer, diagnosis, principles of treatment Neoplasia and the eye

UNIT-5

Connective Tissue disease

Anatomy and Pathophysiology :Arthritis Eye and connective tissue disease

UNIT-6

Thyroid Disease

Anatomy and physiology of the thyroid gland Classification of thyroid disease Diagnosis, complications, clinical features, management, thyroid disease and the eye

UNIT- 7

Tuberculosis

Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment, tuberculosis and the eye

UNIT-8

Helminthiasis

Classification of helminthic diseases, Schistosomiasis, principles of diagnosis and management

UNIT-9

Common tropical medical ailments (Malaria, Leprosy, etc.) Introduction to tropical diseases; Malaria

Tropical diseases and the eye – leprosy, toxoplasmosis, syphillis trachoma

UNIT-10

Malnutrition

Aetiology, protein energy malnutrition, water electrolytes, minerals, vitamins, nutritional disorders and the eye

UNIT-11

Introduction to Immunology

Introduction, components of the Immune system, principle of Immunity in health, Immunology in disease, Immunology and the eye

UNIT-12

Neurological disorders – Stroke/CVA Disseminated sclerosis and subacute combined degeneration Anatomy eith pathophysiology Disseminated sclerosis and subacute combined degeneration Eye and connective tissue disease

UNIT-13

General Medical Emergencies – first aid Ocular/general

UNIT-14

Genetics Introduction to genetics Organization of the cell Chromosome structure and cell division Gene structure and basic principle of genetics Genetic disorders and their diagnosis Genes and the eye Genetic counseling and genetic engineering

Reference Books:

1. Davidson's principles and Practice of Medicine, Ed. John Macleod, 14th Ed., ELBS/Churchill Livingstone (PPM)

PROJECT WORK (605)