



NIMS UNIVERSITY

SYLLABUS
OF

DIPLOMA IN OPHTHALMIC TECHNOLOGY – DOT10

VERSION 1.2

DIRECTORATE OF DISTANCE EDUCATION

Shobha Nagar, Jaipur-Delhi Highway (NH-11C), Jaipur- 303121
Rajasthan, India

DIPLOMA IN OPHTHALMIC TECHNOLOGY – DOT10

Eligibility	:	10 th
Programme Duration	:	3 Years
Programme Objectives	:	The scope of Optometry includes the detection of common eye diseases, the management of binocular vision problems such as squints and lazy eyes and the prescription of spectacles and contact lenses. The Diploma in Optometry is a programme that aims to produce professionally competent optometrists serving as primary eye care health practitioners. NIMS University is one of the few premium institutions in India that offers a Diploma in Optometry.
Job Prospects	:	After the completion of DOT, you will find challenging career opportunities with Optician shops, eye doctors, and Contact Lens companies, Ophthalmic lens industry and hospital eye departments. A technician can work for eye testing, Contact lenses, squint exercises, etc. Common job profiles of students after completing DOT include: Optometry Assistants, ophthalmic assistants and ophthalmic nurses.

YEAR I

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
ENG12101	Communication For Professionals	70	30	4
ANT12101	Basic Anatomy & Physiology	70	30	5
BCH12101	Basic Biochemistry	70	30	5
MBL12101	Basic Microbiology	70	30	5
PHY12101	Basic Physics of Light	70	30	5
ANT12101P	Basic Anatomy & Physiology	35	15	1
PHY12101P	Basic Physics of Light	35	15	1
MBL12101P	Basic Microbiology	35	15	1
TRN12101	Hospital Training-I	200		1
			TOTAL	28

YEAR II

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
CSC12207	Fundamentals of Computer Science	70	30	4
OPT12201	Physical and Geometrical optics	70	30	5
PHM12202	Basic Pharmacology	70	30	5
OPH12201	Basic Ocular Anatomy	70	30	5
PSY12201	Basic Physiology and Biochemistry	70	30	5
OPT12201P	Physical and Geometrical optics	35	15	1
PHM12202P	Basic Pharmacology	35	15	1
OPH12201P	Basic Ocular Anatomy	35	15	1
TRN12201	Hospital Training -II	200		1
			TOTAL	28

YEAR III

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
WCM12301	Environmental & Bio Medical Waste Management	70	30	4
OPH12301	Basic Diseases of Eye	70	30	5
OPH12302	Basic Mechanical & Dispensing Optics.	70	30	5
OPH12303	Public Health & Community Ophthalmology	70	30	5
OPH12304	Visual Optics	70	30	5
OPH12304P	Visual Optics	35	15	1
OPH12302P	Basic Mechanical & Dispensing Optics.	35	15	1
OPH12301P	Basic Diseases of Eye	35	15	1
TRN12301	Hospital Training-III	200		1
			TOTAL	28

DETAILED SYLLABUS

INSTRUCTIONAL METHOD: Personal contact programmes, Lectures (virtual and in-person), Assignments, Labs and Discussions, Learning projects, Industrial Training Programmes and Dissertation.

YEAR I

COMMUNICATION FOR PROFESSIONALS- ENG12101

UNIT	CONTENTS
1.	<p>Parts of Speech: Definition of all the eight parts along with examples and their use in language.</p> <p>Definite and Indefinite articles: a, an, and, the, Definition and its uses along with examples.</p> <p>Types of Pronouns: Personal, Reflexive, Emphatic, Demonstrative, Relative, Indefinite, Interrogative and Distributive pronouns.</p> <p>Noun: Defining noun along with types and categories, Gender, Number case</p> <p>Adjective: Adjective, Comparison, Adjective used as nouns, Positions of the Adjective and Correct use of Adjectives.</p> <p>Verb: Definition, Its forms, Verbs of incomplete predication, Phrases (defining it along with examples). Adjective, Adverb and Noun Phrase.</p> <p>Clauses: Defining it along with examples: Adverb, Adjective and Noun Clauses.</p> <p>Sentence and its Types: Simple, Compound and Complex, Subject and Predicate (parts of a sentence), Transformation of Sentences. Active and Passive voice, Mood and Narration (Direct and Indirect speeches).</p>
2.	<p>Words and Phrases: Word formation (prefix, suffix), Idioms, Synonyms and Antonyms, Phonetics, Speech sound, The phoneme, The syllable and IPA transcription.</p>
3.	<p>Business Correspondence I: Paragraph writing, Introductory remarks, Principles, Writing of single paragraphs and precise writing Letter writing Quotations and Orders- Orders and tenders, Inviting and sending quotations, Placing orders and Inviting tenders.</p>
4.	<p>Business Correspondence II: Notices, Agenda and Minutes, Application letter, Importance and function, Drafting the application, Elements structure, Preparing CV's.</p>
5.	<p>Applied Grammar:</p>

	Correct usage of Grammar, Structure of sentences, Structure of paragraphs, Enlargements of vocabulary.
6.	Business Writing: Written composition, Precise writing and summarizing, Writing of Bibliography, and Enlargement of vocabulary.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. English Grammar and Composition Wren and Martin. S. Chand & Company Ltd.
- B. Intermediate English Grammar; Raymond Murphy Pub: Foundation Books, New Delhi
- C. Eng. Grammar usage and Composition; Tickoo & Subramanian Pub: S. Chand and Co.
- D. Living Eng. Structure; Standard Alien.

BASIC ANATOMY & PHYSIOLOGY- ANT12101

UNIT	CONTENTS
1.	The Human Body: Definitions, Sub-divisions of Anatomy, Terms of location and position, Fundamental planes, Vertebrate structure of man, Organization of the body cells, Tissues.
2.	The Skeletal System: Types of bones Structure and growth of bones Division of the skeleton Appendicle skeleton Axial skeleton Name of all the bones and their parts Joints classification, Types of movements with examples.
3.	Anatomy of Circulatory System: Heart Size, Position coverings, Chambers, Blood supply, Nerve supply The blood vessels General plan of circulation Pulmonary circulation Names of Arteries, Veins and their position - Lymphatic system general plan.
4.	Anatomy of the Respiratory System: Organs of respiratory, Larynx, trachea, Bronchial tree, Respiratory portion, Pleurae and lungs Brief knowledge of parts and position.
5.	Anatomy of the Digestive System: Components of Digestive system Alimentary tube Anatomy of organs of digestive tube, Mouth, Tongue, Tooth, Salivary glands, Liver, Biliary apparatus, Pancreas, Names and position and brief functions.

6.	<p>Anatomy of the Nervous System: Central nervous system, The Brain, Hind brain, Midbrain, Forebrain, Brief structure, Locations, and Peripheral nervous system, Spiral card, Anatomy, Functions, Reflex – Arc, Ménages. Injuries to spinal card and brain.</p>
7.	<p>Anatomy of the Endocrine System: Name of all endocrine glands their position, Hormones and their functions– Pituitary, Thyroid, Parathyroid, Adrenal glands, Gonads & islets of pancreas.</p>
8.	<p>Anatomy of Excretory system and Reproductive system: Kidneys location, Gross structure, Excretory ducts, Urethras, Urinary bladder, Urethra, Male reproductive system, Testis, Duct system Female reproductive system, Ovaries Duct system, Accessory organs.</p>
9.	<p>Blood: Definitions, Composition, Properties and function of Blood Haemogram (RBC, WBC, Platelet count, HB concentrations) Function of plasma proteins Haemopoiesis Blood Group–ABO and RH grouping Coagulation & Anticoagulants Anemia- Causes effects & treatment Body fluid compartments Composition, Immunity Lymphoid tissue Clotting factors Mechanism of blood clotting Disorders of white blood cells, Disorders of platelets, Disorders of clotting.</p>
10.	<p>Cardiovascular System: Function of cardiovascular system Structure of cardiovascular system Cardiac cycle, Functional tissue of heart & their function Cardiac output, E.C.G., Blood pressure, Heart Rate.</p>
11.	<p>Respiratory System: Function of respiratory system Functional (physiological) Anatomy of Respiratory system Mechanism of respiration Lung volumes & capacities Transport of respiratory gases.</p>
12.	<p>Digestive System: Function of digestive system Functional Anatomy of digestive system Composition and functions of all digestive juices Movements of digestive system (intestine) Digestion & absorption of carbohydrate, Proteins & fats.</p>
13.	<p>Muscle Nerve Physiology: Type of muscle Structure of skeletal muscle Sarcomere Neuromuscular junction & transmission Excitation and contraction coupling (mechanism of contraction).</p>

14.	Structure and Function of Skin: Body temperature, Fever, Regulation of temperature.
15.	Excretory System: Excretory Organs, Kidneys, Function, Nephron, Juxta Glomerular apparatus, Renal circulation Mechanism of urine formation Mechanism of micturition Cystometrogram, Diuretics, Artificial kidney.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Text books of Physiology. Author : Guyton (Arthor C). Prism publishers Bangalore.
- B. Human Physiology. Author : Chaterjee (cc). Medical allied agency
- C. Concise Medical physiology. Author : Choudhary (Sujit km.). New central books Kolkata.
- D. Review Medical physiology. Author : Ganang. Application and Lange.

BASIC BIOCHEMISTRY- BCH12101

UNIT	CONTENTS
1.	Introduction to Medical lab Technology: General introduction, Role of medical lab technologist, Ethics, Responsibility, Safety measures and first aid, Cleaning and care of general laboratory glassware and equipments.
2.	Distilled Water: Types of distilled water, Plants, Preparation & storages.
3.	Analytical Balance: Principle & maintenance, Preparation of reagents.
4.	Standard Solutions: Various std, solutions used Their preparation & storage of chemicals.
5.	Units of measurements: S.I. units, Definitions conversions, Measurement of volume, Strength Normality.
6.	Molarity, Molality: Volumetric apparatus Calibration of volumetric apparatus.
7.	Carbohydrate: Definition, Classification, Functions, Properties and Osazone formation.
8.	Proteins and Amino acids: Definition, Classification, Functions and Chemical reactions.
9.	Nucleic acids: Definition types and functions.
10.	Lipids: Definition, Classification, Function of lipids and lipoproteins.
11.	Enzyme: Definition, Classification,

	Factors affecting enzyme action Inhibition Diagnostic importance of enzymes and isoenzymes.
12.	Carbohydrate Metabolism: Definition and importance of Glycolysis Glycogenesis Glycogenolysis Gluconeogenesis Kreb's cycle, Cori's Cycle.
13.	Blood Glucose Regulation: Glycosuria, Glucose tolerance tests, Protein metabolism.
14.	Urea: Deamination, Transamination and Urea formation.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Biochemistry – Lubert Stryer.
- A. Biochemistry – Powar and Chatwal

BASIC MICROBIOLOGY- MBL12101

UNIT	CONTENTS
1.	Introduction and Brief History of Microbiology: Definition, History and relationship of micro org. to man and Safety measures in Microbiology.
2.	Culture Media: Preparation of various media Standardization and use, Sterilization-Definition Different methods and principles-Moist heat-dry heat Radiation & filtration Autoclave-its structure, Functioning control & indicators.
3.	Antiseptics and Disinfectants: Definition types, Mode of action & properties, Uses of disinfectant & antiseptics, Testing efficiency.
4.	Glassware: Description of glassware its use handling and care.
5.	Staining: Principle of Grams & AFB staining,
6.	Culture Methods: Aerobic and anaerobic culture methods.
7.	Antigen and Antibodies: General characters and nature of antigen and antibody, Principle of antigen antibody reaction.
8.	Clinical Samples: Collection, Transportation and processing of Clinical Samples for Microbiological Investigations.
9.	Laboratory Organization: Laboratory organization. Management, Recording of results and quality control in microbiology.

10.	Viruses: Introduction to Virology, Physiochemical characteristics of Viruses.
11.	Protozoa: General characters and classification of Protozoa of Medical importance.
12.	Systemic Microbiology: Identification of Bacteria Micrococci, Staphylococci, Pneumococci, Corynebacteria, Escherichia coli, Klebsiella, Enterobacter, Proteus, Providencia Salmonella, Shigella, Arizona, Citrobacter, Yersinia, Pseudomonas, Vibrio Cholera, Haemophilus, Mycobacteria, Buccella, Bordetella, Bacillus, Clostridia, Anaerobic Cocci, Neisseria, Treponema, Borrelia Leptospria, Mycoplasma, Rickettsia, Chlamydia, Tric agents.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Brock TD, Madigan MT,(1993) Biology of microorganisms, Prentice Hall Int. Inc.
- B. Ananthanarayanan R. and C. K. Jayaram Paniker (1997) Text of Microbiology, Orient Longman.
- C. Prescott Harley Klein: (1996) Microbiology III ed. ECB Pub.
- D. Tauro,P. Kapoor,K.K.and Yadav,K.S. (1996) Introduction to Microbiology. New Age International Pub. New Delhi.

BASIC PHYSICS OF LIGHT - PHY12101

UNIT	CONTENTS
1.	Light: Light-Introduction, Types. Properties Of Light- Properties of Light, Propagation of Light. Types of Waves-Measurable Parameters of Waves, Electromagnetic Spectrum.
2.	Reflection: Laws of Reflection, Reflection through Plane Mirrors. Reflection through Spherical Mirrors. General Aspects of Reflection, Sign Convention of Rays, Position of Image, Images in Concave Mirrors, Images in Convex Mirrors.
3.	Refraction: Refraction of Light-Factors Affecting the Bending of Light, General Aspects of Refraction. Laws of Refraction-Refractive Index, Critical Angle, Total Internal Reflection. Refraction through Various Surfaces-Refraction through Glass Plate , Refraction at Curved Surfaces
4.	Lenses-Types of Lenses: Formation of Convex Lenses, Formation of Concave Lenses. Geometrical Construction of Images- Principal Axis or Optical Axis, Focal Length, Dioptre. Determination of Optical Centre of the Lens. Image Formed by Various Lenses- Image Formation by Convex Lenses, Image Formation by Concave Lenses.
5.	Prism: Refraction through Prisms, Polychromatic Effects, Nomenclature of Prisms, Rotating Prisms, Uses of Prisms.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Text book of Ophthalmology : Dr. A.K. Khurana
- B. Essentials of Ophthalmology : Dr. L.P. Agarwal

BASIC ANATOMY & PHYSIOLOGY- ANT12101P

UNIT	CONTENTS
1	Practical Anatomy: Practical's related to anatomy & physiology-such as knowledge of surface anatomy of human body Identification of bones and parts on x-ray film as radiological anatomy.
2	Charts and Identification: Preparing charts of human anatomy systems & structures of human body Identification and knowledge of pathological specimens Visit of Anatomy & Pathology museum.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Text books of Anatomy. Author: Guyton (Arthor C). Prism publishers Bangalore.
- B. Human Physiology. Author: Chaterjee (cc). Medical allied agency

BASIC PHYSICS OF LIGHT - PHY12101P

UNIT	CONTENTS
1	Practical I- Properties of Light, Propagation of Light. Measurable Parameters of Waves
2	Practical II- Reflection through Plane Mirrors. Reflection through Spherical Mirrors. Images in Concave Mirrors, Images in Convex Mirrors. Refraction through Glass Plate , Refraction at Curved Surfaces Image Formation by Convex Lenses, Image Formation by Concave Lenses. Refraction through Prisms

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Text book of Ophthalmology : Dr. A.K. Khurana
- B. Optician's Guide-A Manual for Opticians by Ajay Kr Bhootra-Jaypee

BASIC MICROBIOLOGY– MBL12101P

UNIT	CONTENTS
1.	Instrument: Compound Microscope.
2.	Demonstration and Sterilization of Equipments: Hot Air oven, Autoclave, Bacterial filters.
3.	Demonstration: Demonstration of commonly used culture media, Nutrient Broth, Nutrient Agar, Blood Agar.
4.	Growth Media: Chocolate agar, MacConkey medium, LJ media, Robertson Cooked meat media, Potassium Telluride media with growth, MacConkey medium with LF & NLF, NA with staph.
5.	Tests: Antibiotic Susceptibility Test, Demonstration of common serological tests – Widal, VRDL, ELISA.
6.	Staining: Grams Staining, Acid Fast Staining
7.	Stool Exam: Stool exam for Helminth ova
8.	Hospital Visit: Visit to hospital for demonstration of biomedical waste management.
9.	Culture: Anaerobic Culture Methods.
10.	Instrument: Compound Microscope.
11.	Demonstration and Sterilization of Equipments: Hot Air oven, Autoclave, Bacterial filters.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. http://www.cuteri.eu/microbiologia/manuale_microbiologia_pratica.pdf
- B. Practical Microbiology by Vasanthakumari, BI Publications Pvt Ltd, 2009

HOSPITAL TRAINING-I-TRN12101

YEAR II

FUNDAMENTALS OF COMPUTER SCIENCE- CSC12207

UNIT	CONTENTS
1.	Computer Application: Characteristic of computers, Input, output, storage units, CPU, Computers system.
2.	Computers Organization: Central Processing Unit, Control Unit, Arithmetic Unit, Instruction Set, Register, Processor Speed.
3.	Memory: Main Memory, Storage Evaluation Criteria, Memory Organization, Memory Capacity, Random Access Memories, Read Only Memory, Secondary Storage Devices, Magnetic Disk, Floppy and Hard Disk, Optical Disks CD-ROM, Mass Storages Devices.
4.	Input Devices: Keyboard, Mouse, Trackball, Joystick, Scanner, Optical Mark Reader, Bar-code reader, Magnetic ink character reader, Digitizer, Card reader, Voice recognition, Web cam, Video Cameras.
5.	Output Devices: Monitors, Printers, Dot Matrix Printers, Inkjet Printers, Laser Printers, Plotters, Computers Output Micro Files (Com), Multimedia Projector.
6.	Operating System: Microsoft Windows, An overview of different version of windows, Basic windows elements, File managements through windows, Using essential accessories: System tools Disk cleanup Disk defragmenter, Entertainments, Games, Calculator, Imagine-Fax, Notepad, paint, Word Pad, Recycle bin, windows Explorer, Creating folders icons.
7.	Word Processing: Word processing concepts, Saving, closing opening and existing documents, Selecting text, edition text, Finding and replacing text, Printing documents, Creating and printing merged documents, Mail merge, Character and paragraph formatting, Page designs and Layout, Editing and proofing tools checking and correcting spelling, Handling graphics, Creating tables and charts, Documents templates and wizards.
8.	Presentation Package: Creating opening and saving presentations, Creating the look of your presentation, Working in different views working with slides, Adding and formatting text, formatting paragraphs, Checking spelling and correcting typing mistakes, Making notes pages and handouts, Drawing and working with objectives, Adding clip art and other pictures, Designing slides shows, Running and controlling a slid show, Printing Presentations.
9.	Internet and Email: Use of Internet and Email, Internet, Websites (Internet Sites), The Mail protocol suite.
10.	Hospital Management System: Types and Uses, Hospital Management & System Package, Advanced Hospital Management System, X O Hospital Management System, LCS Hospital Management Information System, NVISH Hospital Management System, CSPM-Hospital Management System.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Foundations of computing first edition, 2002: P.K. Sinha and P. Sinha.

PHYSICAL AND GEOMETRICAL OPTICS- OPT12201

UNIT	CONTENTS
1.	<p>Properties Of Light: Properties of Light</p> <p>Propagation of Light- Types of Waves Measurable Parameters of Waves Electromagnetic Spectrum</p> <p>Photobiology- Photon Ray Law of Inverse Squares Formation of Image.</p> <p>Interference- Huygens' Principle Uses of Interference Laser Interferometer.</p> <p>Polarization- Clinical Applications of Polarization.</p>
2.	<p>Principle of Reflection and Refraction: Laws of Reflection, Reflection through Plane Mirrors. Reflection through Spherical Mirrors-General Aspects of Reflection Sign Convention of Rays</p> <p>Images- Position of Image, Images in Concave Mirrors, Images in Convex Mirrors.</p> <p>Refraction of Light- Factors Affecting the Bending of Light, General Aspects of Refraction. Laws of Refraction- Refractive Index, Critical Angle, Total Internal Reflection.</p> <p>Refraction through Various Surfaces- Refraction through Glass Plate , Refraction at Curved Surfaces</p> <p>Prisms- Refraction through Prisms, Polychromatic Effects, Nomenclature of Prisms, Rotating Prisms, Uses of Prisms.</p>
3.	<p>Lenses: Types of Lenses, Formation of Convex Lenses, Formation of Concave Lenses.</p> <p>Geometrical Construction of Images- Principal Axis or Optical Axis, Focal Length, Diopetre. Determination of Optical Centre of the Lens</p> <p>Image Formed by Various Lenses- Image Formation by Convex Lenses, Image Formation by Concave Lenses. Size and Position of Image.</p>

	<p>Cylindrical Lenses- Convex Cylinder, Concave Cylinder, Sturm's Conoid.</p> <p>Combination of Lenses- Gauss Theorem, Combination of Cylindrical Lenses</p>
4.	<p>Visual Angle: Visual Acuity- Components of Visual Acuity, Factors Affecting Visual Acuity. Measurement of Visual Acuity Test types used in Adults Test types used in Children Objective Assessment of Vision Assessment of Near Vision.</p>
5.	<p>Axes of the Eye- Optical Axis, Visual Axis, Fixation Axis</p> <p>Visual Angles- Angle Alpha, Angle Gamma, Angle Kappa</p> <p>The Dioptric Notation of Lenses (Vergence)- The Advantages of the Dioptric Notation Vergence, The Notation of Cylinders, The Detection Measurement of Lenses</p> <p>Optical Systems- Refraction by Combination of Lenses, Compound Homocentric Systems, Thick Lenses.</p>
6.	<p>Optical Aberrations: Optical Aberrations of Lenses, Aberrations Depending Upon the Light, Monochromatic Aberrations. Optical Aberrations of the Eye- Aberrations Depending Upon the Light, Monochromatic Aberrations. Anomalies as a Dioptric Apparatus.</p>

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Geometrical And Physical Optics By R.S. Longhurst-Orient Longman Limited

BASIC PHARMACOLOGY- PHM12202

UNIT	CONTENTS
1.	<p>Basic Concepts of Drugs: Drug Terminology, Characteristics of drugs, Drug forms, Drug Components Sources of Drugs Clinical trials of the Drug, Drug Interactions Legal Terms Referring to Drugs</p> <p>Routes of Administration of Drugs- Oral Route, Injection Routes, Through the Skin, Intravenous Route, Sublingual Route, Rectal Route, Vaginal Route, Ocular Route, Nasal Route, Inhalation, Cutaneous Route</p>

	Drug Processing in the Body(Pharmacokinetics)- Absorption, Distribution, Metabolism, Excretion
2.	Divisions of Nervous System: Central Nervous System, Peripheral Nervous System Drugs Affecting Parasympathetic Nervous System- Adrenergic Drugs.
3.	Drugs Affecting the Cardiovascular System: Cardiac Glycosides, Anti Anginal Drugs, Anti Hypertensives Drugs Affecting the Respiratory System- Cough Bronchial Asthma Drugs Affecting the Digestive System- Ulcers, Emetics, Anti-emetics and Prokinetic Agents, Purgatives (Laxatives, Cathartics, Evacoants), Diarrhoea, Drugs Used in Other Intestinal Diseases Drugs Affecting the Excretory System- Diuretics
4.	Antiallergic Drugs: Common Allergens, Causes of Allergic Reaction, Symptoms of Allergic Reaction, Diagnosis of Allergic Reaction Anti-allergic Drugs for the Treatment of Allergy
5.	Antibiotics: Antibacterial Agents, Classification of Antibacterial, Description of Different Antibacterials Antifungal Drugs- Introduction Classification of Antifungal Agents Description of Commonly Used Antifungals.
6.	Antiviral Drugs: Introduction to Antiviral Drugs Classifications of Antiviral Agents Description of Commonly Used Antivirals.
7.	General and Local Anaesthetics: Introduction Mode of Action Classification of Local Anesthetics Drugs for Local Anesthetics Adverse Effects General Anesthetics
8.	Sedatives and Hypnotics: Classification- Barbiturates, Benzodiazepines (BZPs)

ADDITIONAL READINGS:

- A. Basic Concepts in Pharmacology: What You Need to Know for Each Drug Class-By Janet Stringer-The McGraw Hill Companies

BASIC OCULAR ANATOMY- OPH12201

UNIT	CONTENTS
1.	<p>Gross Anatomy And Embryology Of Eye: Introduction</p> <p>Gross Anatomy of Eyeball and Orbit- General Anatomy of the Eyeball and Orbit General Shape of the Eyeball Layers of the Eyeball General Concepts of the Structures within the Eyeball</p> <p>Embryology of Eyeball- Specific Embryological Stages of Eyeball Embryology of Specific Ocular Structures</p> <p>Growth and Development of Eye.</p>
2.	<p>Anatomy Of The Outer Coat Of The Eyeball: Introduction</p> <p>Anatomy Of The Outer Coat Of The Eyeball- Anatomy of Conjunctiva Coat of Eyeball Anatomy of Cornea Anatomy of Sclera</p>
3.	<p>Anatomy Of The Middle Coat of The Eyeball: Introduction,</p> <p>Anatomy of Uveal Tract- Anatomy of Iris Anatomy of Ciliary Body Anatomy of Choroid</p> <p>Anatomy of Anterior and Posterior Chambers</p>
4.	<p>Anatomy Of Lens: Introduction Anatomy of Lens</p>
5.	<p>Anatomy Of The Inner Coat Of The Eyeball And Anatomy Of Vitreous: Introduction</p> <p>Anatomy of Retina and its Special Regions- Anatomy of Retina Special Regions of the Retina</p> <p>Anatomy of Vitreous</p>
6.	<p>Anatomy Of Optic Nerve And The Visual Pathway: Introduction Parts of Visual Pathways Optic Nerve Optic Chiasma Optic Tract Lateral Geniculate Nucleus Optic Radiation Visual Cortex Arrangement of Fibres in Visual Pathway</p>
7.	<p>Anatomy Of Lids And Lacrimal System: Introduction Description of Eye Lids and Lacrimal System</p>

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Ocular Anatomy and Physiology-By Al Lens, Comt Comt, Sheila Coyne Nemeth, Janice K. Ledford-Slack incorporated

BASIC PHYSIOLOGY AND BIOCHEMISTRY- PSY12201

UNIT	CONTENTS
1.	<p>Eyelids, Lacrimal Apparatus And Tear Film Dynamics: Introduction</p> <p>Structure and Functions of the Eyelids- Functions of the Eyelids Physiology of Eyelid Movements Blinking and Peering</p> <p>Functions of the Lacrimal Apparatus- Tear Secretion Control of Tear Production Tear Drainage</p> <p>Tear Film Dynamics- Functions of Tear Film Physical Properties of Tear Film Tear Dynamics Tear Film Dysfunction Treatment of Dry Eye</p>
2.	<p>Aqueous Humour And Intra Ocular Pressure: Introduction</p> <p>Structure and Functions of Aqueous Humour- Formation of Aqueous Humour Aqueous Movement and Outflow Aqueous Composition Physio-chemical Properties of Aqueous</p> <p>Intra-ocular Pressure- Diurnal Variation of intra-ocular Pressure Measurement of Intra-ocular Pressure Increase in Intra-ocular Pressure Lowering Intra-ocular Pressure Factors Affecting intra-ocular pressure</p>
3.	<p>Pupil And Pupillary Reflexes: Introduction</p> <p>Pupillary Reflexes</p> <p>Pupil- Appearance of the Pupil Accommodation Neuronal Pathways</p> <p>Pupillary Defects-</p>

	<p>Marcus Gunn Pupil (RAPD) Argyll Robertson Pupil (ARP) Adie's (Tonic) Pupil Homer's Pupil Iris Coloboma</p>
4.	<p>Muscles and Movements of the Eye: Extra-ocular Muscles- Recti and Oblique Muscles Planes of Muscles</p> <p>Intra-ocular Muscles Uni-ocular Movements</p> <p>Binocular Movements- Laws Governing Ocular Movements</p> <p>Abnormalities of Gaze- Latent Squint (Anisophoria or Heterophoria) Manifest Squint (Heterotropia) Pseudosquint (Pseudo-false)</p>
5.	<p>Vision: Light Sense, Night Vision And Colour Vision: Introduction</p> <p>Visual Impulse and Perception- Initiation of Visual Impulse Transmission of Visual Sensation Analysis of Visual Perception</p> <p>Colour Vision- Young's Trichromatic Theory Details of Colour Vision, Defective Colour Vision</p> <p>Light Sense- Adaptation Dark Adaptation</p> <p>Contrast Sense</p>
6.	<p>Visual Pathway, Fields And Visual Cortex: Introduction Retina, Optic Nerve, Optic Chiasma, Optic Tract, Lateral Geniculate Body, Optic Radiations</p> <p>Visual Cortex- Physiological Aspects</p> <p>Visual Fields- Perimetry Methods of Visual Field Examination</p>
7.	<p>Visual Acuity, Uni-Ocular And Binocular Vision: Measurement of Visual Acuity- Test Types Snellen's and Landolt's</p> <p>Binocular Vision- Advantages of Binocular Vision Retinal Correspondence Horopter (Horizon of Vision) Panum's Area</p>

	Tests for Binocular Single Vision
8.	Accommodation And Convergence: Introduction Accommodation- Mechanisms Theories of Accommodation Convergence
9.	Electro-Physiology Of The Eye: Introduction Electro-retinogram Visual Evoked Response Electro-oculogram
10.	Biochemistry Of The Eye: Introduction Vascular Circulation of the Eye Metabolism of Cornea Corneal Transparency Metabolism of Lens Physio-chemical Properties of Vitreous

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Reading 1 - Ophth Assistant Vol-V (Community Ophth) - Dr. L.P. Agarwal

HOSPITAL TRAINING-II-TRN12201

YEAR III

ENVIRONMENTAL & BIO MEDICAL WASTE MANAGEMENT- WCM12301

UNIT	CONTENTS
1.	Environment Introduction: Biotic and Abiotic environment, Adverse effects of Environmental Pollution, Control Strategies, Various Acts and Regulation.
2.	Water Pollution: Water Quality Standards for potable water, Surface and underground water sources, Impurities in water and their removal, Denomination, Adverse effects of domestic waste water and industrial effluent to surface water sources, Eutrophication of lakes, Self purification of steams.

3.	Air Pollution: Sources of air contaminations, Adverse effects on human health, Measurement of air quality standards and their permissible limits, Measure to check air pollution, Greenhouse effect, Global warming, Acid rain, Ozone depletion.
4.	Bio Medical Waste: Bio Medical Waste Management, Introduction to bio medical waste, Types of bio medical waste, Collection of bio medical waste.
5.	Land Pollution: Land Pollution, Soil conservation, Land erosion, Afforestation.
6.	Ecology: Ecology, Basics of species, Population dynamics, Energy flow, Ecosystems, Social Issues and the Environment, Sustainable development and Life Styles, Urban problems related to energy, Resettlement and Rehabilitation of people, Energy flow, Consumerism and waste products Water Harvesting and Rural Sanitation- Water harvesting techniques, Different schemes of Rural Water Supply in Rajasthan, Rural Sanitation, Septic Tank, Collection and disposal of wastes, Bio-gas, Community Awareness and participation.
7.	Renewable Sources of Energy: Non-Conventional (Renewable) source of energy, Solar Energy, Wind energy, Bio mass energy and Hydrogen energy.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Environmental science-Coming ham Saigo.
- B. Solid waste management-C.L. men tall.
- C. Environmental Technologies for Sustainable Development Dr. Upendra Pnadel, DR M.P. Poonia.

BASIC DISEASES OF EYE- OPH12301

UNIT	CONTENTS
1.	<p>Common Eye Diseases: Disease of Eyelids, Disease of Orbit, Diseases of Adnexa, Disease of Conjunctiva, Diseases of Cornea, Disease of Sclera, Disease of Uvea, Disease of Lens, Glaucoma, Disease of Retina</p> <p>Injuries- Injuries of Eye, Optic Nerve, Sclera Episclera: Ectasia and staphyloma, Scleritis and episcleritis</p> <p>Orbit- Orbital anatomy, Incidence of orbital abnormalities, Methods of orbital examination, Congenital and development anomalies of the orbit, Orbital tumors, Orbital inflammation, Sinus disorders affecting the orbit, Orbital trauma.</p>

2.	<p>Conjunctiva And Cornea: Inflammation Therapeutic principles Specific inflammatory diseases</p> <p>Tumors- Tumor of epithelial origin Glandular and adnexal tumors Tumors of neuroectodermal origin Vascular Tumors, Xanthomatous origin, Inflammatory tumors, Metastatic lesions</p> <p>Degeneration and Dystrophies- Definition Degeneration's , Dystrophies Miscellaneous Conditions Kerato conjunctivitis Sicca (K-Sicca)</p> <p>Tear function tests Steven Johnson syndrome Ocular Rosacea</p> <p>A topic eye disorders Benign mucosal pemphigoid (BMP) ocular pemphigoid Vitamin A deficiency Metabolic diseases associated with corneal changes.</p>
3.	<p>Iris, Ciliary Body And Pupil: Congenital anomalies Primary and secondary diseases of the iris and ciliary body Tumors Anomalies of papillary reaction</p> <p>Choroid: Congenital anomalies of the choroid, Diseases of the choroid, Tumors.</p>
4.	<p>Ocular Diseases I: Eyelid anatomy B Congenital and developmental anomalies Blepharospasm, Ectropion, Entropion, Trichiasis and symblepharon</p> <p>Eyelid inflammations, Eyelid tumors, Ptosis, Eyelid retraction, Eyelid trauma</p> <p>Lacrimal System, Lacrimal, anatomy, Lacrimal pump, Methods of lacrimal evaluation, Congenital and development anomalies of the lacrimal system, Lacrimal obstruction, Lacrimal Sac tumors, Lacrimal Trauma.</p>

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Common Eye Diseases and their Management-Nicholas R. Galloway, Winfried M. K. Amoaku, Peter H. Galloway, Andrew C Browning

BASIC MECHANICAL & DISPENSING OPTICS- OPH12302

UNIT	CONTENTS
1	Lens-Form and Analysis: Spherical Lenses, Standard Lens Form, Astigmatic Lense, Cylindrical Lenses, Toric Lense, Base Curve
2	Writing Prescription and Transposition: Writing Prescription, Simple Transposition, Simple Transposition, Rule of Simple Transposition, Toric Transposition, Steps of Toric Transposition.
3	Power Specification and Measurement: Lens Power, Power Specification, Surface Power, Approximate Power, Vertex power, Effective Power, Power Measurement Hand Neutralization, Lensometer, Geneva Lens Measure.
4	Optical Prisms-Uses and Decentration: Terminology, Properties of Prisms, Units for Specifying Power of Prism, Effect of Prism on movement of Eye, Prentice Rule, Use of Prism in Spectacle, Other Type of Prisms, Risly Prism, Slab Off prism, Fresnel Press on Prism.
5	Ophthalmic Raw Materials and Manufacturing: Glass lens Materials Manufacturing of Glass Plastic Lens Materials, Manufacturing of Plastic Lenses Impact Resistance Lenses, Heat Tempering process, Chemical Tempering Lenses.
6	Lens Surfacing and Glazing: Surfacing Step of Lens Surfacing Glazing, Laying off, Lens Cutting and Edging Formers, Edge Form.
7	Lens Quality and Inspection: Faults, Defects Occurring during Manufacturing Process, Surface Faults, Errors in Power of Lens.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Optics by Ajoy Ghatak, Tata McGraw-Hill Education (2012)
- B. Ophthalmic Lenses & Dispensing By Mo Jalie

PUBLIC HEALTH & COMMUNITY OPHTHALMOLOGY- OPH12303

UNIT	CONTENTS
1	Concepts In Community Health: Natural History of Disease Interaction of Agent Host and Environmental Factors Spectrum of Disease Determinants of Health Levels of Prevention, Primary Prevention, Secondary Prevention, Tertiary Prevention

	<p>Indicators of Health- Mortality Indicators Morbidity indicators Disability Indicators Nutritional Status Indicators Utilisation Rates Indicators</p> <p>Indicators of Social and Mental Health- Environmental Indicators Socio-economic Indicators</p> <p>Health Care Delivery Indicators HFA Indicators, Indices</p> <p>Epidemiological Surveillance- Definition of Surveillance Purpose/ Use of Surveillance Methods of Surveillance Epidemiological Surveillance System Limitations of Surveillance</p>
2	<p>Health for all and Primary Health Care: Concept, Scope and Vision of HFA, Primary Health Care and Components, Principles of Primary Health Care New Course of Action for Health Implications of the Primary Health Care Approach Distribution of Primary Health Care Centres Role of Hospitals in Primary Health Care Hospitals versus Primary Health Care: A False Antithesis The Need for Hospital Involvement, Role and Functions of the Hospital at the First Referral Level, Issues in Role of Hospital in Primary Health Care Health for All in the Twenty-first Century, Targets, Primary Health Care Infrastructure.</p>
3	<p>Basics Of Epidemiology And Biostatistics: Concept of Epidemiology Important Epidemiological principles and Concepts Natural History of Disease, Epidemiological Triad, Levels of Prevention/Intervention Risk Approach in Health Care Measurement Epidemiological Methods Descriptive Epidemiological Studies Analytical Epidemiological Studies Epidemic Management Patterns of Epidemics Epidemic Forecasting and Management Screening, Biostatistics, Sampling, Measures of central Tendency, Correlation, Regression, Standard Error of Sampling Distribution, Significance Testing Tests of Significance</p>

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Community Ophthalmology by P. J. Graham , The Author, 1983
- B. Textbook of Ophthalmology by H V Nema

VISUAL OPTICS- OPH12304

UNIT	CONTENTS
1	<p>Myopia: Emmetropization Myopia Etiology of Myopia</p> <p>Classification of Myopia- By Clinical Appearance On the Basis of Degree On the Basis of age of Onset</p> <p>Clinical Features of Myopia Visual Acuity and Magnitude of Myopia Signs and Symptoms of Myopia Degenerative Myopia, Correction of Myopia, Prescription Guidelines.</p>
2	<p>Hypermetropia: Classification of Hypermetropia- On the Basis of Etiology By Clinical Appearance By Degree of Hypermetropia By Accommodative Status Clinical Feature Hypermetropia Management of Hypermetropia</p> <p>Aphakia- Cause of Aphakia, Sign and Symptoms of Aphakia, Optics of Aphakia, Refraction. Correction Options for Aphakia</p>
3	<p>Astigmatism: Astigmatism- Causes of Astigmatism, Signs and Symptoms of Astigmatism, Diagnosis of Astigmatism, Classification of Astigmatism, Type of Astigmatism</p> <p>Classification According to Focus, Treatment of Astigmatism, Prescription Guidelines.</p>
4	<p>Presbyopia: Presbyopia Cause of Presbyopia, Presbyopia and Different Refractive Condition Reading Addition, Different Types of Presbyopic Correction Reading Glasses, Bifocals, Progressive Addition Lenses, Monovision.</p>
5	<p>Anisometropia and Aniseikonia: Anisometropia Classification of Anisometropia Sign and Symptoms of Anisometropia Management of Anisometropia Aniseikonia, Etiology, Classification, Features of Aniseikonia Clinical Measurement of Aniseikonia, Knapp's law. Spectacle Magnification, Relative Spectacle Magnification.</p>
6	<p>Visual Acuity: Factors Affecting Visual Acuity Components of Visual Acuity Log Mar Charts, Clinical Testing of Visual Acuity, Chart Illumination, Testing Distance, Testing Procedures, Clinical Significance of Visual Acuity Assessment, Pediatrics Visual Acuity Testing, Preschool Children, Visual Acuity Testing for Infants and Toddlers, Near</p>

	Visual Acuity.
7	Contrast Sensitivity and Glare Testing: Contrast, Contrast Sensitivity Tests, Arden Plates, Vistech Charts, Cambridge Low Contrast Grating Test, Pelli Robson Letter Chart, Regan's Law Contrast Acuity Chart, Clinical Significance of Testing Contrast, Glare, Disability Glare, Discomfort Glare, Reflected Glare, Management of Glare.
8	Color Vision: Color Vision Defect Color Vision Testing Pseudo Isochromatic Plate Tests Arrangement Tests Anomaloscopes Management of Patients with color defects.
9	Accommodation: Range and Amplitude of Accommodation, Amplitude of Accommodation, Methods of Measurement, Relative Accommodation.
10	Convergence: Measurement of Convergence Range and Amplitude of Convergence Measurement of Convergence Components of Convergence Relative Convergence Accommodative Convergence/Accommodation Ratio Clinical Measurement of AC/A Ratio.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

- A. Optics by M. H. (Michael Harold) Freeman, C. C. Hull, Ph.D., W. N. Charman-Elsevier Health Sciences

HOSPITAL TRAINING-III-TRN12301

