FUNDAMENTALS OF HUMAN ANATOMY & PHYSIOLOGY (THEORY)
Course Code: ANA/PHY.101T
Credit Hours: 3
Semester: I

SECTION I: HUMAN ANATOMY

UNIT-I : Structure & function of human body (2 Lectures)

- Definitions, Subdivisions of Anatomy, Terms of location and position, Fundamental Planes, organization of human body. Cell (structure & function). Tissues (Epithelium, Connective, Muscular, Nervous)

UNIT- II : Locomotion and support (2 Lectures)

- *Skeletal system:* Types of bones, Bones and their parts, Divisions of skeleton
- *Joints:* classification, types of movements with examples.

UNIT- III : Nervous system (2 Lectures)

- *Central nervous system*: Spinal Cord (anatomy, functions), reflex- arc, meninges.
- *Brain:* Hind Brain, Midbrain, Forebrain.

UNIT-IV : Sensory System (2 Lectures)

- Anatomical introduction to skin & Sense organs: Eye, Ear ,Nose

UNIT-V : Circulatory system (2 Lectures)

- *Heart:* size, location, coverings, chambers, blood supply, the blood vessels. General plan of circulation, pulmonary circulation. Names of arteries and veins and their positions.

UNIT- VI : Respiratory system (2 Lectures)

- Organs of Respiratory System. Brief knowledge of parts and position
- *Conducting portion:* Nose, nasal cavity, Para nasal air sinuses, Larynx, trachea, bronchial tree.
- *Respiratory portion:* Pleura and lungs.

UNIT- VII: Digestive system (2 Lectures)

- Components of Digestive system, Anatomy of organs of digestive system, mouth, tongue, teeth,
- salivary glands, liver, biliary apparatus, pancreas.

UNIT- VIII: Excretory system (2 Lectures)

- *Kidneys:* location, gross structure, excretory ducts, ureters, Urinary bladder, Urethra.

UNIT- IX: Reproductive system (2 Lectures)

- *Male Reproductive System:* Testis, Duct system.
- *Female Reproductive System:* Ovaries, Duct system

UNIT- X : Endocrine system (2 Lectures)

- *Endocrine glands:* Positions, Hormones secreted and their functions- Pituitary, Thyroid parathyroid, Adrenal glands, Gonads & Islets of pancreas

SECTION II: HUMAN PHYSIOLOGY

Unit I – Cell **(1 Lecture)**

Cell membrane& cytoplasmic organelles- Functions

Unit II – Blood **(4 Lecture)**

Composition and function of blood

Blood Cells- Types, structure and functions

Blood group- ABO Blood group & Rh factor, Blood groups and uses of blood grouping. Rh incompatibility

Blood Clotting: Definition, Mechanism of haemostasis, Physiology of clotting mechanism.

Anemia- Definition, Types and Clinical features of anemia.

Unit III – Cardiovascular System **(3 Lecture)**

Functions of heart and blood vessels

Heart rate :- Definition and factors affecting it

Cardiac cycle: Definition and events in the cardiac cycle, Heart sounds

Unit IV - Respiratory System **(2 Lecture)**

Functions of Respiratory organs

Mechanism of Respiration: Inspiration & expiration, Muscles of Inspiration & Muscles of expiration, Accessory muscles of Respiration

Lung Volumes and Capacities: Vital Capacity, Tidal Volume, Residual Volume

Unit V – Gastrointestinal system **(3 Lecture)**

Functions of various parts of GIT

Digestion & absorption of carbohydrates, fats, protein in various parts of GIT

Functions of Saliva, Gastric Juice, Bile, Pancreatic Juice

Functions of Liver , Gall Bladder and Pancreas

Movements of Small Intestine and large Intestine

Unit VI - Excretory System **(4 Lecture)**

Functions of kidney, ureters, urinary bladder and urethra

Nephron & Function of various parts

Mechanism of Urine Formation

Unit VII – CNS **(4 Lecture)**

Introduction: Organization and function of the nervous system

Central Nervous System: General Description- Cerebral hemisphere (cerebrum); Basal ganglia, Thalamus; Hypothalamus, Brain stem: Medulla; Pons, Mid Brain; Reticular formation, Cerebellum, Spinal Cord: Structure and function; Ascending (sensory) tracts; Descending (motor) tracts, Cerebrospinal fluid (CSF)

Peripheral nervous System: Somatic nervous system: Spinal nerves; Reflexes: Mono and Polysynaptic reflex; Cranial nerves

Autonomic nervous system (ANS): Sympathetic, parasympathetic

Unit VIII - Muscular System **(4 Lecture)**

Structure & Functions of skeletal muscle, smooth muscle & Cardiac muscle

Skeletal Muscle: -Action Potential, Excitation contraction coupling, Muscle tone, Neuro- Muscular Junction

Unit IX – Endocrine System **(5 Lecture)**

Hormones: GH, Thyroid Hormones, Parathyroid Hormones, Insulin, Glucocorticoids, Mineralocorticoids, ADH, oxytocin, Testosterone – their source & actions

FUNDAMENTALS OF HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)
Course Code: ANA/PHY.101P
Credit Hours: 1.5

- Identification and description of all anatomical structures.
- Demonstration through slides, models, charts etc..
- Measurement of pulse, blood pressure
- Identification/counting of blood cells by study of peripheral blood smear
- Determination of blood groups, bleeding/clotting times. Estimation of Hb

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONCEPTUAL MICROBIOLOGY & PATHOLOGY (THEORY)
Course Code: MIC/PAT.102T
Credit Hours: 3
Semester: I

SECTION I : MICROBIOLOGY

UNIT- I: Origin and Evolution of Microbiology (3 Lectures)

- Introduction, History & scope of Microbiology
- General characteristics of Microorganisms: Bacteria, viruses, fungi.

UNIT - II: Study of Common Lab Instruments (3 Lectures)

- Microscope: Types , principles & uses
- Autoclave, Hot air oven, Incubator, Laminar air flow, Colony counter : Principles & uses

UNIT III: Morphology of Bacteria & Viruses (3 Lectures)

- *Bacterial anatomy:* Cell wall, Cell membrane, Capsule, Flagella, Nucleoid, Bacterial Spore.
- Structure of viruses, Concepts of replication & cultivation
- Study of bacteria: Preparation of Stains, various Staining techniques (Simple staining, Gram staining, Acid-fast staining, Negative staining & Albert staining).

UNIT- IV: **Growth & Nutrition of bacteria: (3 Lectures)**

- Culture media and Culture methods
- *Bacterial Growth:* Growth Curve, Generation Time, Environmental factors affecting growth.
- Bacterial nutrition: Nutritional groups, Common Nutritional requirements

UNIT- V: Control of Microbial Growth (3 Lectures)

- Sterilization and disinfection

UNIT-VI: Immunity & Infection (3 Lectures)

- *Immunity:* Types of immunity, Antigens & Antibodies, Prophylactic Immunization
- *Infection:* Types, Various routes & modes of transmission, Nosocomial Infections

UNIT-VII: Biomedical Waste & Management (2 Lectures)

- Waste categories, Waste treatment & disposal

SECTION II : PATHOLOGY

UNIT-I: Introduction (1 Lectures)

- Definition, important terminology, different branches

UNIT-II: Cell Injury and Cellular Adaptations (4 Lectures)

- *Cell Injury:* types of cell injury, etiology of cell injury, morphology of cell injury, cellular swelling.
- *Cell Death:* types- Autolysis, Necrosis, Apoptosis & Gangrene.
- *Cellular Adaptations*: Atrophy, Hypertrophy, Hyperplasia & Dysplasia.

UNIT-III: Inflammation (3 Lectures)

- Acute inflammation - vascular event, cellular event, inflammatory cells.
- Chronic Inflammation - general features

UNIT-IV: Hemodynamic Disorders (3 Lectures)

- Edema, hyperemia, congestion, hemorrhage, thrombosis, ischemia & infarction.

UNIT-V: Neoplasia (2 Lectures)

- Definition, difference between benign tumor and malignant tumor.

UNIT-VI: Healing (2 Lectures)

- Definition, different phases of healing, factors influencing wound healing.

CONCEPTUAL MICROBIOLOGY & PATHOLOGY (PRACTICAL)
Course Code: MIC/PAT.102P
Credit Hours: 1.5

Microbiology

- Handling and maintenance of instruments required for routine lab work.
- *Various staining Techniques:* Gram stain, Acid-fast stain, Negative stain, Albert Stain.
- Various culture techniques
- Demonstration of Sterilization methods
- Preparation of commonly used culture media: Nutrient agar, Blood/chocolate agar, MacConkey agar, Sabouraud dextrose agar.

Pathology

- Components & setting of the Compound microscope.
- Focusing of object.
- Use of low & high power objectives of microscope.
- Use of oil immersion lens.
- Care and Maintenance of the microscope.
- Different types microscopy

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONCEPTUAL BIOCHEMISTRY (THEORY)
Course Code: BIO.103T
Credit Hours: 2
Semester: I

UNIT -I: Introduction to Biochemistry (2 Lectures)

- Important definitions (Diffusion, Osmosis, Surface Tension, Adsorption , Absorption) & scope of biochemistry

UNIT -II: Carbohydrate (3 Lectures)

- Classification with structures
- Importance of Carbohydrates

UNIT -III: Lipids (3 Lectures)

- Classification
- Importance of Lipids

UNIT -IV: Proteins (4 Lectures)

- Amino Acid: Classification and general Properties
- Importance of Proteins
- Classification of Protein (in brief)

UNIT -V: Nucleotides (4 Lectures)

- Nucleoside & Nucleotide
- General structures of Purine and pyrimidine
- Brief discussion of DNA & RNA
- Structure of DNA

UNIT -VI: Electrolytes (3 Lectures)

- Source, function & deficiency symptoms of Sodium, Potassium, Calcium, phosphorus, Iron, Zinc & Chloride in human body.

UNIT - VII: Analytical Chemistry (5 Lectures)

Concepts of : Percent, Morality, Molality, Normality

- *SI Units:* Deci, Centi, Milli, Micro, Nano, Pico, Kilo, Mega, Giga & Angstrom
- **Normal Values & Interpretations:**
  - *Electrolytes:* Sodium, Potassium, Calcium, Iron, Chloride
  - *Renal Function Test*: Urea, Creatinine, Uric Acid, Glucose
  - *Urine Analysis:* Composition, Colour, Volume, pH, Specific Gravity, Turbidity
  - *Liver Function Test :* SGOT, SGPT, Bilirubin, Albumin, Globulin & Alkaline Phosphatase
  - *Carbohydrates:* Fasting , Random, GTT
  - *Lipid Profile :* Cholesterol, Triglycerides, HDL,LDL, VLDL

UNIT -VIII: Acids & Bases (2 Lectures)

- Definition, Classification of acids and bases.
- Physical and chemical properties with examples.
- Arrhenius concept of acids and bases.
- Classification of acids and bases.
- pH, Buffer Solutions

CONCEPTUAL BIOCHEMISTRY (PRACTICAL)
Course Code: BIO.103P
Credit Hours: 1.5

- Preparation of common lab reagents.
- General description of equipment's used in Biochemistry Lab.
- *Working & Uses of:* Spectrophotometer, Water bath, Centrifuges, Analytical Balances, pH meter, Colorimeter.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

HUMAN VALUES & PROFESSIONAL ETHICS
Course Code: PMS.104T
Credit Hours: 2
Semester : I

UNIT-I: Need, Basic Guidelines, Content and Process for Value Education (10 Lectures)

- Understanding the need, basic guidelines, content and process for Value Education
- Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT-II: Understanding Harmony in the Human Being - Harmony in Myself! (10 Lectures)

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
- Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of 'I' and harmony in 'I'
- Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Swasthya - Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT-III: Understanding Harmony in the Family and Society (10 Lectures)

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

GEOMETRICAL OPTICS (OPTICS-I) (THEORY)
Course Code: OPT.105T
Credit Hours: 3
Semester: I

UNIT – I **(6 Lectures)**

Light: dual nature- particle & wave nature, speed, wave length & frequency of light.

UNIT - II **(6 Lectures)**

Fermats' principle- laws of relation & refraction at a plane surface using Fermats' principle.

UNIT – III **(6 Lectures)**

Snells' law, relative and absolute refractive indices, total internal reflection and Critical angle, refraction by plane parallel slab of glass; molecular basis of reflectively (basic index).

UNIT - IV **(7 Lectures)**

Geometrical path length & optical path length of rays, Concept of wave fronts & rays, concept of divergence & convergence.

UNIT – V **(8 Lectures)**

Refraction by spherical surfaces- convex & concave, Derivation of vergence equation, focal points, power, image point, lateral & axial magnification, simple numerical.

UNIT - VI **(8 Lectures)**

Thin Lens- shapes, derivation of lens makers' formula, thin lens vergece equation, equivalent focal length of two thin lenses separated by a distance & placed in contact, lateral magnification of thin lenses in contact, simple numerical, concept of reduced systems.

UNIT - VII **(7 Lectures)**

Thick Lens- Cardinal points & planes, front & back vertex power, matrix theory in paraxial Optics to locate positions of cardinal planes. Different types of aberrations & their effects.

UNIT - VIII **(6 Lectures)**

Prism- Dispersion of prism, reflecting prisms , prisms diopters.

UNIT – IX **(6 Lectures)**

Geometrical theory of optical fibers. Uses of optical fibers.

GEOMETRICAL OPTICS (OPTICS-I) (PRACTICAL)
Course Code: OPT.105P
Credit Hours: 1.5

- Determination of the focal length & hence the power of a convex lens by displacement method.
- Determination of the refractive index of a transparent liquid by using a travelling microscope.
- Determination of the refractive index of the material of a convex lens measuring its focal length, using the lens & a plane mirror.
- Determination of the focal length of a concave mirror by graphical method.
- Determination of refractive index of the material of a prism by minimum deviation method.
- To draw i-δ curve of a prism by a spectrometer & hence to find out the angle of minimum deviation.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

ENGLISH FOR PROFESSIONALS
Course Code: PMS.106T
Credit Hours: 2
Semester: I

UNIT-I: Grammar **(10 Lectures)**

- Narration.
- Voice change (Use of passive voice particularly in scientific and official writing).
- Use of articles and preposition.
- The language of Doctor and Patient.
- General description and Medical description.
- Medical terminology – roots.
- Prefixes and suffixes.
- Medical abbreviations.
- Punctuation
- Common errors in English.

UNIT-II: Writing Skills **(10 Lectures)**

- Precis writing.
- Report writing (with special stress on scientific/technical reports, preparing field/observation report).
- Letter writing/application writing (Social, business letter, applying for a job, for higher studies, Preparing curriculum vitae, subscribing to a journal, letters to the Editor).
- Essay writing

UNIT-III: Spoken English **(10 Lectures)**

- Advertisements/Posters
- Telegrams & short post cards
- Note & notice
- Front Desk management, Fixing appointments, getting information – Managing medical representatives, able to answer FAQs, lab reports writing, telephoning in a hospital: the object is to practice influent conversation.

SCHEME OF EXAMINATION

Type of Questions	Total No. of Questions	No. of Questions to be attempted	Marks (Each Question)	Subtotal
SEC -A (Grammar)	25	20	1	20
SEC -B (Essay writing)	3	1	10	10
SEC-C(Precis writing)	1	1	5	10
SEC-D(Letter writing)	2	1	5	10
			TOTAL MARKS	**50**

COMMUNICATION AND SOFT SKILLS
Course Code: PMS.107T
Credit Hours: 2
Semester: I

UNIT-I: Introduction to Communication **(5 Lectures)**

- Purpose of Communication
- Process of Communication
- Importance of Communication in Business
- Barriers to Communication
- Measures to Overcome the Barriers to Communication.

UNIT-II: Types of Communication **(5 Lectures)**

- Verbal Communication: Importance of verbal communication and Advantages of verbal communication
- Non Verbal Communication: Importance of written communication and Significance of Non-verbal Communication

UNIT-III: Communication Network **(5 Lectures)**

- Scope and Types of Communication Network
- Formal and Informal Communication Network
- Upward Communication
- Downward Communication
- Horizontal Communication
- Diagonal Communication.

UNIT-IV: Letter and Resume Writing **(5 Lectures)**

- Types of Letter – Formal/Informal
- Importance and function of Letter Writing
- Business Letters / Elements of Structure
- Resume and Covering Letter
- Guidelines for making a Result – Oriented Resume/ Helpful Hints

UNIT-IV: Interview preparation **(5 Lectures)**

- Types of Interview
- Preparing for an Interview
- Attending an Interview
- Employers Expectation
- General Etiquette

UNIT-IV: Group Discussion and Presentation **(5 Lectures)**

- Process of Group Discussion
- Guidelines
- Helpful Expressions
- Evaluation

UNIT-VI: Presentation Skills **(5 Lectures)**

- Importance of Presentation skills
- Organizing Contents/ Structural Elements of a Presentation Concerning Data
- Visual Aids and Voice & Picture Integration
- Guidelines to make Presentation Interesting
- Body Language

(Note: Every student shall be given 15 minutes of presentation time)

SCHEME OF EXAMINATION

Type of Questions	Total No. of Questions	No. of Questions to be attempted	Marks (Each Question)	Subtotal
SEC -A (Fill ups)	10	10	1	10
SEC -B (Short Essay)	6	5	4	20
SEC-C (Long Essay)	3	2	5	10
SEC-D (Letter writing)	2	1	10	10
			TOTAL MARKS	**50**

ENVIRONMENTAL STUDIES
Course Code: PMS.108T
Credit Hours: 2
Semester: II

UNIT-I : Natural Resources (10 Lectures)

- *Renewable and non-renewable resources :*Natural resources and associated problems.
- *Forest resources :* Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
- *Water resources :* Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- *Mineral resources :* Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- *Food resources :* World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- *Energy resources:* Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- *Land resources:* Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT-II : Ecosystems (4 Lectures)

- Concept of ecosystems, Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- *Introduction, types, characteristic features, structure and function of the following ecosystem:* Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-III: Biodiversity and its Conservation (3 Lectures)

- Introduction – Definition: genetic, species and ecosystem diversity.
- *Threats to biodiversity:* habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- *Conservation of biodiversity:* In-situ and Ex-situ conservation of biodiversity.

UNIT-IV: Environmental Pollution (7 Lectures)

- *Definition, Cause, effects and control measures of :* Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution
- Role of an individual in prevention of pollution.
- *Disaster management:* floods, earthquake, cyclone and landslides.

UNIT-V : Social Issues and the Environment (4 Lectures)

- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust

- *ACTS:* Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act

UNIT-VI : Human Population and the Environment (2 Lectures)

- Population explosion – Family Welfare Programme.
- Human Rights & Value Education.
- Women and Child Welfare.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

PHYSICAL OPTICS (OPTICS-II) (THEORY)
Course Code: OPT.109T
Credit Hours: 4
Semester: II

UNIT-I: Nature of Light (15 Lectures)

- Dual nature of light- Simple harmonic motion- differential; Simple harmonic waves- mathematical representation; Super position of simple harmonic waves.
- HUYGENS' principle – laws of reflection and refraction at plane and spherical surfaces.Wave velocity & group velocity; determination of velocity of light (any one method.)
- *Interference:* Coherence; path and phase difference; Theory of interference fringesintensity distribution infringes; Young's double slit experiment- Fresnels' biprism, Lloyds' error experiments; visibility of fringes.
- Interference in thin films due to reflected and transmuted light- Interference in wedge Shaped films; Newton's ring experiment ; Color of thin films; Thin film antireflection wating and filters.

UNIT- II: Diffraction (15 Lectures)

- Diffraction by single slit; double slit, multiple slit- grating, circular aperture – amplitude & intensity distribution (final expressions only)
- Circular aperture- airy pattern, resolution by circular apertures.
- Diffraction grating- reflection, traasnussion , amplitude & phase gratings(definitions in brief) Grating dispersion & dispersue power, spectral resolution; zone plates.

UNIT- III: Polarization & Crystal Optics (15 Lectures)

- Concept of polarization , linear , circular , elliptical polarization (qualitatively), Plane of polarization & vibration, degree of polarization, polarizes, analyzers, Production of polarized light, birefringence, calculate crystal , veal prism, Wallaston prism , retarders - full, half & quarter wave plates, analysis of light of unknown Polarization.
- Linear Scattering- Raleigh & Mce
- Principles of LASERs
- Holography – basic principle; simple experimental arrangement, some applications.

UNIT-IV: Spectrum (15 Lectures)

- Sources of spectrum. Bunsen - carbon - mercury - sodium
- Emission and absorption spectra -classification - visible - ultra violet and infra spectra - electromagnetic spectrum.

PHYSICAL OPTICS (OPTICS-II) (PRACTICAL)
Course Code: OPT.109P
Credit Hours: 2

- To determine the wavelength of a monochromatic light source with the help of Fresnel's Biprism.
- To determine the radius of curvature of convex surface of a lens by Newton's ring method.
- To determine Planck's constant using photocell.
- To study the diffraction through a single slit & to determine its width.
- To determine the slit width & the separation between the slits of a double slit system from its Fraunhoffer diffraction pattern.
- Determination of the wavelength of monochromatic light using diffraction grating.
- To calibrate a Polarimeter & hence to determine the unknown concentration of sugar solution.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

OCULAR ANATOMY (THEORY)
Course Code: ANA.110T
Credit Hours: 3
Semester: II

UNIT-I: Embryology –Ocular (3 Lectures)

- Formation of optic vesicle & optic stalk, formation of lens vesicle, formation of optic cup, changes in associated mesoderm, development of various structure of eye ball – retina, optic nerve, crystalline lens, cornea, sclera, choroid, cilliary body, iris, viterous. Development of accessory structures of eyeball – eyelids, lacrimal apparatus, extra-ocular muscles, orbit.

UNIT-II: Orbit (4 Lectures)

- Bony orbit- Size, shape & relations, walls of the orbit , Base of the orbit, Apex of orbit.
- Orbital fascia -Fascial bulbi, Fascial sheaths of extraocular muscles, intermuscular septa.
- Spaces of orbit - Orbit fat & reticular tissue - Apertures at the base of orbit- Contents of the orbit– Orbital nerve(oculomotor , Trochler, Abducent, Trigeminal, facial nerves) - their functional components, course & distribution, clinically applied aspects.

UNIT-III: Cornea (2 Lectures)

- Layers & peculiarities,
- Blood supply & nerve supply of cornea.
- Corneal Transparency.

UNIT-IV: Lens , Zonules (2 Lectures)

- Structure of lens -capsule, Ant. Epithelium, lens fibers (structured & zonal arrangement),
- Ciliary zonules -structure gross appearance
- Arrangement of zonules fibers.

UNIT-V: Uveal Tract & its vascular supply (2 Lectures)

- Iris macroscopic & microscopic appearance.
- Ciliary body –Macroscopic structure.
- Chloride - Macroscopic structure
- Blood supply to uveal structure- short & Long Posterior artery & Anterior Artery
- Venous drainage.

UNIT-VI: Vitreous (1 Lecture)

- Main masses of vitreous. Base of the vitreous. Hyaloidean vitreous. Vitreous cells.

UNIT-VII: Sclera (1 Lecture)

- Anterior, posterior & middle apertures. Episclera. Sclera proper. Lamina fusca. Blood supply of the sclera. Nerve suply of the sclera.

UNIT-VIII: Anterior Chamber and Its Angle (1 Lecture)

- Angle of the anterior chamber. Trabecular meshwork. Canal of Schlemm. Schwalbe's line. Drainage of aqueous humor.

UNIT-IX: Retina & its vascular supply (2 Lectures)

- Gross anatomy
- Microscopic structure of fovea centralize, Blood retinal barrier
- Anatomy of optic nerve
- Visual pathway

UNIT-X: The Ocular Motor System (2 Lectures)

- Extraocular muscles, nerve supply, motor nuclei, supra nuclear motor centers.

UNIT-XI: The Pupillary & Ciliary Muscle (1 Lecture)

Anatomy of sphincter & Dilator muscle. Ciliary muscle – Anatomy, types. The nerve supply of the eye ball.

UNIT-XII: The Lachrymal Appears (1 Lecture)

- Lachrymal gland, Palpebral part
- Ducts of lachrymal gland, Structure of the lachrymal gland
- Blood supply & nerve supply of the lachrymal gland, Lachrymal passages.

UNIT-XIII: Anatomy of Ocular Adnexa & Glands (3 Lectures)

- *Lids :* Structures of the lids: -Glands of the Lids- Meibomaian Glands, Glands of Zela and Glands of Moll. Blood Supply of the Lids, Lymphatic Drainage of the Lids, Nerve Supply of the Lids.
- *Conjunctiva :* Palpebral Conjunctiva, Bulbar Conjunctiva, Conjunctival Fornix, Microscopic Structure of the conjunctiva. Blood Supply of the Conjunctiva, Nerve Supply of the Conjunctiva, Caruncle, Plica Semilunaris.

OCULAR ANATOMY (PRACTICAL)
Course Code: ANA.110P
Credit Hours: 1.5

- Identification of ocular histology slides.
- Identification of projection slides of Ocular Anatomy.
- Identification of structure & related viva.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

OCULAR PHYSIOLOGY (THEORY)
Course Code: PHY.111T
Credit Hours: 3
Semester: II

Unit I: Cornea, Uveal Tissue & Lens (2 Lecture)

Brief idea about ultra & histological structure of cornea, corneal transparency & hydration. Corneal vascularisation.

Uveal Tissue: Brief idea about uvea. Uveo-scleral drainage. Schlemm's canal.

Lens: Basic idea about human lens. Function of Lens. Lens transparency. Changes in ageing lens. Cataract- Overview.

Unit II: Aqueous / Vitreous Humour (2 Lecture)

Formation of Aqueous humour. Drainage & circulation of Aqueous Humour. Rates of production & flow. Function of Aqueous humour.

Vitreous Humour: Composition & Distribution of vitreous humour, Physiology & function of vitreous humour.

Intraocular pressure: features of normal IOP, factors influencing the IOP, control of IOP, Measurement of IOP.

Unit III: Retina, Optic Nerve & Ocular Circulation (2 Lecture)

Retinal structure- layers of retina. Brief idea about rod & cones. Organization of retina. Function of retina.

Optic Nerve: Physiology of optic nerve. Papilledema of optic nerve.

Unit IV: Protective Mechanism of Eye (2 Lecture)

Blinking: Muscles of lid closer & lid opening (orbecularis occulli, levator palpebre, Muller's muscle, blinking reflexes.

Lacrimation: Lacrimal glands, pre corneal tear film, Tear film dynamics, secretion of tear, formation of tear, retention & redistribution of tear.

Unit V: The Ocular Motor System (2 Lecture)

Extra ocular muscles their function & nerve supply

Ocular Movements: Monocular movements

Binocular Movements- VERSIONS- (saccadic & pursuit movement, position maintenance movements, stabilization movements & their characteristics). VERGENCES-(Convergence, divergence, vertical vengeance).

Unit VI: Pupil (1 Lecture)

Normal pupil, Physiological changes in pupil size, pupillary reflex- Light reflex, near reflex, Dark reflex.

Unit VII: The Pupillary & Ciliary Muscle (1 Lecture)

Anatomy of sphincter & Dilator muscle. Ciliary muscle- Anatomy, types. The Nerve supply of the eye ball.

Unit VIII: Anatomy of Ocular Adnexa & Glands (3 Lecture)

Lids: Structure of the lids:- skin, Subcutaneous, Areolar layer, Layer of Staiated muscle, Submuscular Areolar Tissue, Fibrous Layer, Conjunctiva Glands of lids- Meibomaian Glands. Blood supply of the lids, Lymphatic Drainage of the lids, Nerve Supply of the lids.

Conjunctiva: Palpebral Conjunctiva, Bulbar Conjunctiva, Conjunctival Fornix, Epithelium, Substantia Propria, Conjunctival Glands- Krause's Glands. Blood supply of the Conjunctiva, Nerve Supply of the Conjunctiva, Semilunaris.

OCULAR PHYSIOLOGY (PRACTICAL)
Course Code: PHY.111P
Credit Hours: 1.5

- Observation of lashes and eyebrows under magnification
- Measurement of the palpebral fissure- vertical and horizontal
- Rate of blinking
- Observation – Menace and dazzle reflex – Aural blinking:
- Observation of the tear film and marginal tear strip
- Observation of tear glands and puncta
- Tear break up time
- Schirmer's test
- Examination of Cornea
- Measurement of corneal diameter – Horizontal visible iris diameter (HVID)
- To test for corneal sensitivity
- Examination of the iris
- Measurement of pupillary diameter
- Assessing pupillary reflexes
- Examination of the crystalline lens
- Measurement of accommodation
- Screening test for detecting color vision defects

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

VISUAL OPTICS (OPTICS-III) (THEORY)
Course Code: OPT.112T
Credit Hours: 4
Semester: II

UNIT-I: Review Of Geometric Optics **(12 Lectures)**

- Vergence and power
- Conjugacy, Object space and image space
- Sign convention
- Spherical Mirror, catoptric power
- Cardinal points
- Magnification

UNIT-II: Optics of Ocular Structures **(12 Lectures)**

- Cornea and aqueous, Crystalline lens, Vitreous
- Schematic and reduced eye
- Corneal curvature and thickness
- Keratometry
- Curvature of the lens and ophthalmophakometry
- Axial and axis of the eye

UNIT-III: Refractive Anomalies and Their Causes **(12 Lectures)**

- Etiology of refractive nomalies
- Contributing variabilities and their ranges
- Populating distributions and their ranges
- Optical component measurement
- Growth of eye in relation to refractive errors
- Emmetropia, Myopia, Hyperopia
- Astigmatism
- Anisometropia And Aniseikonia
- Presbyopia, Aphakia and pseadophakia
- Correction and management of Amblyopia

UNIT-IV: Far and Points of Accommodation and Vertex Distance **(12 Lectures)**

- Correction of spherical Ametropia
- Axialo versus refractive ametropia
- Relationship between Occomodation and convergence, A/C Ratio
- 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

UNIT-V: Retinoscopy Principles and Methods **(12 Lectures)**

- Retinoscopy-speed of reflex and optimum condition
- Retinoscopy-Dynamic and Static
- Review of objective refractive method
- Cross cylinder method for astigmatism, astigmatic fan test
- Difficulties in objective tests and their avoidance
- Transposition of lenses
- Spherical equivalent

VISUAL OPTICS (OPTICS-III) (PRACTICAL)
Course Code: OPT.112P
Credit Hours: 2

- Measurements of corneal curvature and corneal thickness
- Mathematical models of the eye-Emmetropia, Hyperopia, & Myopia
- Conjugate points-demonstration-worked examples
- Axial and refractive hyperoia-worked examples
- Axial and refractive Myopia-worked examples
- Effect of lenses & prism in front of the eye
- Vision through pinhole, slit filters etc.
- Phorometry
- Visual acuity Stereoacuity in emmetropia
- Myopia and pseudomyopia, Myopia and visual acuity
- Hypermetropia determinationof manifest erroe subjectively
- Myopic correction-subjective verification-monocular and binocular
- Demonstration of astigmatism
- Use of slit and keratometry to find principle meridians
- Stigmatism-subjective verification tests.
- Measurement of accommodation –near and far points and range,cross grid test
- Presoyopic correction and methods – accommodative reserve balancing the relative
- Methods of differentiating axial and refractive ametropia
- Practice of retinoscopy-Emmetropia
- Interpretation of cycloplegic retinoscopic findings

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

BIOSTATISTICS & COMPUTER APPLICATIONS
Course Code: PMS.201T
Credit Hours: 2
Semester: III

SECTION-I: BIOSTATISTICS (15 Lectures)

- Introduction to data and statistics
- Presentation of data:
  - Bar diagram
  - Histogram
  - Frequency polygon
  - Frequency curve, Cumulative frequency curve.
- Measure of central tendency:
  - Mean
  - Median
  - mode (individual, discrete and continuous data).
- Measure of variability:
  - Range
  - Standard deviation
  - Variance and coefficient of variation

SECTION-II: COMPUTER APPLICATIONS (15 Lectures)

- Computer: General Introduction, History of computer development and respective generation: Need to use computers, Applications in Laboratory and in general.
- Input and Output Device
- Memory
- Personal Computer
- Data Representation and Number System
- Software
- Data Communication
- Internet, Cyber etiquette
- Microsoft Office: PowerPoint Presentations, Microsoft word, excel sheet

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURES-I (THEORY)
Course Code: OPT.202T
Credit Hours: 4
Semester: III

Detailed study of the Principles of operation, types, optical properties, constructions, adjustments and applications of the following Instruments and Devices:

- Binoculars, telescopes and projectors **(4 Lectures)**
- Simple and Compound Microscopes (with Huygens and Ramsden Eye pieces and oil immersion objectives) **(4 Lectures)**
- Spectrometer **(4 Lectures)**
- Radioscope **(4 Lectures)**
- Retinoscopes **(4 Lectures)**
- Standard Tests Charts **(4 Lectures)**
- Autorefractometer- subjective and objective types **(4 Lectures)**
- Opthalmoscopes- direct and indirect types **(4 Lectures)**
- Refractometers- Auto refractors, Dioptron **(4 Lectures)**
- Slit lamp Biomicroscope **(4 Lectures)**
- Keratometer **(4 Lectures)**
- Lensometer **(4 Lectures)**
- Trial case lenses-best forms. **(4 Lectures)**
- Trial frame design **(4 Lectures)**
- Cross cylinder **(4 Lectures)**

OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURES-I (PRACTICAL)
Course Code: OPT.202P
Credit Hours: 2

To study the operations of the following instruments:-

- Focimeter or Lensometer
- Retinoscope
- Standard Test Charts
- Autorefractometer
- Slit Lamp Examination
- Keratometer
- Opthalmoscope

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

VISUAL OPTICS (OPTICS-IV) (THEORY)
Course Code: OPT.203T
Credit Hours: 4
Semester: III

UNIT – I **(5 Lectures)**

Correction of myopia- spectacle refraction (F) – ocular refraction(K) – Relationship between F and K.

UNIT – II **(5 Lectures)**

Correction of hypermetropia- the effect of vertex distance change.

UNIT – III **(5 Lectures)**

Correction of ametropia with Thick lenses.Some problems involving K.

UNIT – IV **(5 Lectures)**

Clear and blurred images in the reduced and simplified schematic eyes. The visual axis. Pupil size and blur disc diameter. Depth of field . retinal image size in uncorrected reduced eye.

UNIT – V **(5 Lectures)**

Spectacle magnification in reduced and corrected eyes. Nodal points and clear image size. Retinal images with a near object. Spectacle magnification in near vision. The simple magnifier. Relative spectacle magnification. Correction of spherical ampetropia with contact lens. Spectacle magnification with a contact lens.

UNIT – VI **(5 Lectures)**

Ammetropia in the actual human eye. The growth of the human eye in Ammetropia. Spherical ametropia in adult eye. Genetic aspects of refractive error. Summary of the causative factors involved in ametropia . Progressive myopia. Juvenile stress myopia.

UNIT – VII **(5 Lectures)**

Aphakia. Reflective error in aphakia. The retinal image size in aphakia. Correction of aphkia by a contact lens.

UNIT – VIII **(5 Lectures)**

Use of an intracocular implant. Power of the implant and retinal image size. Clinical aspects of aphakia.

UNIT – IX **(5 Lectures)**

Astigmatism: Oblique astigmatism. Astigmatism in the reduced eye. Th retinal images of point and extended objects. Classification of astigmatism. Correction of astigmatism by sphero- cylindrical, toric and contact lenses.

UNIT – X **(5 Lectures)**

Retinoscopy: principle and use. Clinical recording of standard of vision-visual acuity.

UNIT – XI **(5 Lectures)**

Review of subjective refractive methods. Problem of review of objective refractive methods Cross cylindrical method of detecting astigmatism

UNIT – XII **(5 Lectures)**

Eye as an imaging instrument. Schematic eyes. Diffraction and the eye. Image formation in wave optics. Aberrations of the lens and cornea. Chromatic aberration of the eye. Optical performance of the eye. Total performance of the eye. Variation of visual performance with focus. Contrast sensivity of the eye.

VISUAL OPTICS (OPTICS-IV) (PRACTICAL)
Course Code: OPT.203P
Credit Hours: 2

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

GENERAL AND OCULAR PHARMACOLOGY (THEORY)
Course Code: PHR.204T
Credit Hours: 3
Semester: III

UNIT-I: General Pharmacology (8 Lectures)

- Nature & Sources of drug. Routes of drug administration (general & Ocular). New drug delivery systems. Absorption & Bio availability of a drug. Distribution of a drug. Fate of a drug. Drug excretion & toxicity. Pharmacokinetics of drugs.

UNIT-II: Drug Action (8 Lectures)

- Site of drug action, structure activity relationship. Drug receptor. Mechanism of action of a drug. Dose response relationship. Adverse drugs reactions (ADR) in man, Manifestations of ADR. Treatment of Acute drug poisoning. Factors influencing drug metabolism & drug action. Classification of drugs.

UNIT-III: Drug Action on Nervous System (10 Lectures)

- General Considerations. Aliphatic Alcohol's. General Anesthetics. Sedatives, Hypnotics and Pharmacotherapy of Insomnia. Drugs Effective in Convulsive Disorders. Opioid Analgesics. Analgesic – Antipyretics and Non-steroidal Anti- inflammatory Drugs(NSAID). Central Nervous System Stimulants. Local Anesthetics- Cocaine, Procaine and Other Synthetics Local Anesthetics. Autonomic Nervous System - General Considerations. Adrenergic and Adrenergic Blocking drugs.

UNIT-IV: Principles of Ocular Pharmacology (8 Lectures)

- General principles of ocular pharmacology- Drug actions and effectiveness
- Current optometric drug use- Preparation & packaging of ophthalmic drugs
- Ocular penetration - Routes of ocular administration.

UNIT-V: Optometric Diagnostic Drugs (10 Lectures)

- Optometric use of pharmaceuticals -classification of drug use
- Topical ophthalmic drugs- References and drug indices
- Hazards of ophthalmic drugs-surface active drugs.
- Topical anaesthetics
- Principles and classification of autonomic drugs.
- Sympathomimetics - Sympatholytics
- Parasympathomimetics – Parasympatholytics
- Diagnostic use of autonomic drugs

UNIT-VI: Ophthalmological Drug Use (6 Lectures)

- Drugs that enhance aqueous outflow –Inhibitors of aqueous secretion
- Ophthalmic Drugs – antibiotics, corticosteroids, anesthetics, viscoelastics agents. Antiglaucomic drugs.

GENERAL AND OCULAR PHARMACOLOGY (PRACTICAL)
Course Code: PHR.204P
Credit Hours: 1.5

- Preparation and prescription of drugs of relevance.
- Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation of few charts.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CLINICAL REFRACTION-I (THEORY)
Course Code: OPT.205T
Credit Hours: 3
Semester: III

UNIT – I **(6 Lectures)**

- ***Ophthalmic Case Historian:*** Demographic data, chief complaints, secondary complaints, ocular history, medical history, drugs and medications, family ocular history, family medical history, social history, review of system, few example of history writing.

UNIT – II **(6 Lectures)**

- ***Recording Visual Acuity:*** Distance – Snellens and log MAR. near-points/'M'/RS, use of Baily-lovie word reading chart.

UNIT – III **6 Lectures)**

- ***Objective Refraction:*** Streak Retinoscopy – all procedures to use streak retinoscope; static and dynamic retinoscopy, different methods of dynamic retinoscopy – MEM, Nott's, Sheard's, Low and high neutral, Bells, Cross, Taits. Other methods of retinoscopy-Radical, Near(Mahandra), Chromoretinoscopy, String Lensbar, use of objective and autorefractor.

UNIT – IV **(8 Lectures)**

- ***Subjective Refraction:*** Monocular Distance – Classic fogging, testing of astigmatism under fog fixed astigmatic dial (clock dial), rotary astigmatic dial, combination of fixed and rotary dial (Fan and Block test), J.C.C. Duochrome or Bichrome, Binocular balancing – alternate occlusion, prism dissociation, dissociated duochrome balance, Borish dissociated fogging, equalization

UNIT – V **(8 Lectures)**

- ***Binocular Distance*** – T.I.B. (Turville Infinity Balance), Polarized – Target and polarized filter, fogging. Near subjective refraction. Cycloplegic refraction, cycloidemia, sudden unfogging , Borish delayed spherical end point, pinhole estimation of refractive error, stenopaic slit refraction, measurement of vertex distance, distometer, use of subjective autorefractor.

UNIT – VI **(3 Lectures)**

- Different methods of measuring amplitude of accommodation.

UNIT – VII **(8 Lectures)**

- ***Correction of Presbyopia*** : Different methods of stimulation of tentative presbyopic addition – amplitude of accommodation, J.C.C., NRA-PRA balance, Bichrome, Plus Build-up, based on age, Dynamic retinoscopy. Occupational consideration, finalization of odd for near and intermediatedifferent options of correction

UNIT – VIII **(5 Lectures)**

- Measurement of IPD and significance.
- Final discussion with the patient.
- Writing prescription of power and counseling

CLINICAL REFRACTION-I (PRACTICAL)
Course Code: OPT.205P
Credit Hours: 1.5

- History writing
- Recording VA
- Practice of Streak Retinoscopy
- Direct Opthalmoscopy-Normal Fundus
- Subjective refraction – fogging, clockdial, fan, JCC, prism balance, TIB, duochrome, cyclodeimia, Slit refraction
- Measurement of amplitude of accommodation.
- Presbyopic add
- Writing prescription.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE-II (THEORY)
Course Code: OPT.206T
Credit Hours: 4
Semester: IV

Principles, clinical use (methods) & significance of following instruments:

- Tonometer – Principles, types, clinical importance as a routine procedure (application) **(8 Lectures)**
- Pachometer – Principles, types, clinical importance **(7 Lectures)**
- Devices for color vision testing – CS testing / Glare testing. **(8 Lectures)**
- Ultrasonography – (A scan, B scan) – Principles and application. **(7 Lectures)**
- F.F.A – Principles and demonstration of film. **(7 Lectures)**
- PAM – Principles and importance. **(7 Lectures)**
- Perimeter – Basics of perimetry – Humphray instruments, Automated perimetry – basics, types(names) ,interpretation of normal Glaucoma Field of Definition. **(8 Lectures)**
- LASER – Introduction – Einstein co-efficient, population inversion.Different types of LASER (mention) – Excimer, LasikNd-yag, Argon, Diode, He-Ne gas LASER, Xenon. LASER safety, Ophthalmic LASER application(Argon, Yag) **(8 Lectures)**

OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE-II (PRACTICAL)
Course Code: OPT.206P
Credit Hours: 2

Clinical use of the following instruments & the findings:

- Tonometer
- Devices for color vision testing
- Auto Perimeter-Normal HFA, printout
- A-scan: Normal Print Out & analysis
- B-scan: Normal Print Out & analysis

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

PAEDIATRIC & GERIATRIC OPTOMETRY (THEORY)
Course Code: OPT.207T
Credit Hours: 4
Semester: IV

SECTION-I: PEDIATRIC OPTOMETRY (40 Lectures)

UNIT-I: Examination and Diagnosis (10 Lectures)

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

UNIT-II: Normal appearance, Pathology and structural anomalies (20 Lectures)

- Normal appearance, Pathology and structural anomalies of : Orbit, Eyelids, Lacrimal system, Conjunctiva Cornea, Sclera, Anterior chamber, uveal tract, pupils, Lens, vitreous, fundus, Oculomotor system
- Measurement of refractive status
- Determining binocular status
- Determining sensory motor adaptability

UNIT-III: Post-Examination process (10 Lectures)

- Compensatory treatment and remedial therapy for: Myopia, Pseudo myopis, Hyperopia, Astigmatism, Anisometropis, Amblyopia
- Remedial and compensatory treatment for strabismus and nystagmus
- Vergence and accommodation

SECTION-II: GERIATRIC OPTOMETRY (20 Lectures)

- Structural changes in eye
- Physiological changes in eye
- Optical and refractive changes in eye
- Aphakia, Pseudo aphakia – its correction
- Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders, vascular diseases of the eye.
- Special considerations in ophthalmic dispensing to the elderly
- Management of visual problems of aging
- How to carry on one's visual task overcoming the problems of aging?

PAEDIATRIC & GERIATRIC OPTOMETRY (PRACTICAL)
Course Code: OPT.207P
Credit Hours: 2

- Assessment of children Vision & Paediatric evaluation, diagnosis & management.
- Strabismus & Aniblyopia.
- Non- Strabismic Biuoculan Disorders.
- Evaluation, Diagnosis & Optometric management of children with mental retardation C.P. Dyslexia,
- Multiple Sensory Motor Haudicap.
- Visual Disorders in senior citizens, evaluation, diagnosis+ management.

- Sports vision.
- Refraction in special cases (pseudophakia , aphakia, irregular corneal astigmatism , coloboma of iris,choroids, retina, nystagmus, post R.K., PRK, LASIK)
- Congenital cataract, glaucoma.
- Patient with low vision.
- Patient with anisometropia (Anisokonia)
- Monocular & binocular subjective refraction.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1^{st} ,2^{nd} Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

OCULAR (ANTERIOR SEGMENT) DISEASE-I (THEORY)
Course Code: OPT.208T
Credit Hours: 3
Semester: IV

UNIT – I **(5 Lectures)**

- Anterior segment ocular diseases involving orbit, eyelids, adnexa, conjunctiva, cornea, urea, sclera, anterior chamber, iris and lens. Symptomatology, clinical signs, diagnosis, pathogenesis, pathophysiology , systemic disease relationships and treatment of degenerative, infections and inflammatory conditions affecting these structures.

UNIT – II **(5 Lectures)**

- ***Disease of the Lids*** – Congenital Deformities of the Lids .Oedema of the Lids. Inflammatory Conditions of the Lids. Deformities of the Lid Margins. Deranged Movement of the Eyelids. Neoplasm's of the Lids. Injuries of the Lids.

UNIT – III **(5 Lectures)**

- ***Diseases of the Lachrymal Apparatus***- Dry Eye. Disease of the Lachrymal Gland. Disease of the Lachrymal Passages. Operations for Chronic Dacryocystitis.

UNIT – IV **(5 Lectures)**

- ***Disease of the Conjunctiva***- Subconjunctival Haemorrhage Infective Conjunctivitis. Follicular Conjunctivitis. Granulomatous Conjunctivitis. Allergic Conjunctivitis. Conjunctivitis Associated with Skin conditions. Degenerative conditions of the Conjunctiva. Vitamin- A Deficiency. Cysts and Tumours of the Conjunctiva. Conjunctival Pigmentation . Injuries of the Conjunctiva.

UNIT – V **(5 Lectures)**

- ***Disease of the Cornea*** –Congenital Anomalies. Inflammation of the Cornea (Keratitis). Superficial Keratitis. Deep Keratitis. Vascularisation of Cornea. Opacities of the Cornea. Keratoplasty. Corneal Degenerations. Corneal Dystrophy's. Corneal Pigmentation. Corneal Injuries. Refractive Corneal Surgery. Corneal Ulcer (Bacterial , Viral , Fungal)

UNIT – VI **(5 Lectures)**

- ***Disease of the Sclera***- Episcleritis. Scleritis. Staphyloma of the Sclera. Blue Sclerotic Scleromalacia Performs. Nanophthalmos. Injuries of the Sclera

UNIT – VII **(5 Lectures)**

- ***Disease of the Iris***- Congenital Anomalies. Inflammations (Anterior Uveitis) . Specific Types of Iriodocyclitis . Degenerations of the Iris. Cysts and Tumours of the Iris. Injuries of the Iris.

UNIT – VIII **(5 Lectures)**

- ***Disease of the Celery Body***- Inflammations of the Celery Body. Purulent Iriodocyclitis (Panoph-thalmitis) . Evisceration . Sympathetic Opthalmia. Vogt- Koyanagi – Harada Syndrome. Tumours of the Celery body. Injuries of the Celery body.

UNIT –IX **(5 Lectures)**

- ***Glaucoma***- Formation of Aqueous Humor. Drainage of Aqueous. Intraocular Pressure(IOP) . Ocular Rigidity. Tonography. Developmental Glaucoma (Buphthalmos) . Primary Narrow Angle Glaucoma. Primary Open Angle Glaucoma. Normotensive Glaucoma . Ocular Hypertension . Secondary Glaucoma. Surgical Procedures for Glaucoma(Steps Only) ,YOGPI ,trabeculectomy. Laser Procedure in Glaucoma .Artificial Drainage Devices in Glaucoma Surgery(Molteno)

UNIT- X **(5 Lectures)**

- ***Disease of the Lens*** - Congenital Malformations. Cataract . Congenital and Developmental Cataract. Senile Cataract. Traumatic Cataract. Complicated Cataract. Secondary Cataract . After Cataract.Dislocation of the Lens. SurgicalProcedures for Removal of the Lens(Operative Steps Only).Phacoemulsification(ICCE,ECCE,IOL) . Small Incision Cataract Surgery (Manual Phaco).Intraocular Lens Implantation-AC+PC, IOL.

OCULAR (ANTERIOR SEGMENT) DISEASE-I (PRACTICAL)
Course Code: OPT.208P
Credit Hours: 1.5

- Demonstration of various procedures as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

OPTHALMIC LENS & DISPENSING OPTICS (THEORY)
Course Code: OPT.209T
Credit Hours: 3
Semester: IV

UNIT-I: Ophthalmic Lens (8 Lectures)

- *Characteristics of lenses:* Introduction. Spherical lenses. Plano-cylindrical lenses. Sphero-cylindrical lenses. Designation of lens power. Power of lenses. Transposition. Write the prescription. Base curve of spherical lens. Base curve of cylindrical single vision lens. Aberration of lens. Prism prescription. Prism effects in a lens. Neutralization.

UNIT-II: Spectacle Lenses (4 Lectures)

- Characteristics of lens materials. Specific gravity (weight). Refractive index. Abbe number. Impact resistance. Scratch resistance. Curve variation factor.

UNIT-III: Current Materials & Lens Types (4 Lectures)

- Crownglass. CR-39. High –index glass. High –index plastic. Poly carbonate. Photochromatic materials.
- Single vision lens. Bi-focal lenses. Tri-focal lenses. Vocational & occupational multifocal progressive lenses.

UNIT-IV: Introduction to Bi-Focal Lenses Ophthalmic Lens Coating (8 Lectures)

- History of bi-focal lenses. Modern bi-focal designs. Types of bi-focal designs. Glass tri-focal lenses.
  Invisible multi-focal Double segment lens. Plastic bifocals.
- Anti-reflecting coatings. Special notes concerning anti-reflecting coatings. Protective coating, color
  coating.

UNIT-V: Absorptive lenses , Impact resistant lenses & Lens for special uses (8 Lectures)

- Classification of lens tints. Chemical that produces color & assist in absorptive characteristics of glass lenses. Effect in prescription on lens color. Availability of tinted lenses.
- *Impact resistant lenses:* Types of impact resistant lenses. Plastic lenses. Impact resistant Dress-Eye wear lenses. Tempered glass lenses. Types of impact resistant lenses most beneficial of specific patients.
- *Lens for special uses:* Fresnel lenses. Thinlite lenses. Lenses for the Aphakic patient. Aspheric lenses.
- *Lens surfacing & quality:* Principles of lens surface generation. Glass assessment. Faults in lens
- materials & lens surface. Inspection of lens quality.

UNIT-VI: Basics of Dispensing (18 Lectures)

Spectacle frame

- *Current frame materials:* Plastics, Metals
- *Frame types:* Combination of frames,Half-eye frames,Mounts, Nylon-cord frame, Special purpose frames.
- *Frame measurements:*The boxing system,The datum system,Comparison of the two systems,Lens position
- Segment specification
- *Frame Selection:* Fashion,Function,Feel,Conflicting needs,Price, Standard alignment
- *Lens Selection:* Ground rule for selection, Selection criteria
- *Facial Measurement:*The PD, Visual axes, Measuring inter papillary distance, Using PD ruler, Common difficulties in measuring PDs, Measuring monocular PD, Measuring near PD

- *Measuring heights:* Single vision, Multi focal, Bi-focal, Progressive

Pediatric Dispensing:

- The changing image of spectacle, Age differences.
- *Frame Selection:* Technical Criteria, Fashion criteria, Some tips on selection
- *Lens Selection:* Technical criteria- Communicating with kids, The kids corner
- *Facial measurement of the kids:* PDs, Centers, Bi-focals
- *Dealing with problems*: Dealing with clients, Common client problems, Dealing with professional colleagues, Dealing with the laboratories
- *Special needs dispensing*: Occupational dispensing, Hazards in the work place, Occupational health safety legislation, Common hazards.
- *Eye protection:* Industrial eye protection, Sport, Standards covering eye protection, Lens materials & impact resistance, Frame & eye protection.

OPTHALMIC LENS & DISPENSING OPTICS (PRACTICAL)
Course Code: OPT.209P
Credit Hours: 1.5

- Find out the menidean & optical center of ophthalmic lens
- Neutralization – manual & help of lensometer
- Identification of lens-spherical, cylindrical & spheno-cylindrical lenses
- Lens-surfacing & edging, cutting & marking of single vision bifocal progressive
- Frame measurement, Frame selection & Lens selection
- Facial measurements: The PD, Visual axes, & measuring inter-pupillary distance using P.D ruler.
- Common difficulties in measuring P.D , Measuring monocular P.D, measuring near C.D.
- Measuring heights :- single vision , bifocal, multifocal, progressive

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

COMMUNITY HEALTH
Course Code: PMS.210T
Credit Hours: 2
Semester: IV

- General concepts of health and diseases with reference to natural history of disease with pre-pathogenic and pathogenic phase. The role of socio-economic and cultural environment in health and diseases-Epidemiology and scope. **(3 Lectures)**
- Public health administration-An overall view of the health Administration set up at centre and state level. **(3 Lectures)**
- The National Health Programmes- National Health programmes including tuberculosis, malaria, MCH and HIV/AIDS. **(3 Lectures)**
- Health problems in vulnerable groups-Pregnant and lactating women and infants and school going children-occupational groups, geriatrics. **(3 Lectures)**
- Occupational Health- Definition, scope-Occupational diseases, prevention of occupational diseases and hazards. **(3 Lectures)**
- Social security and other measures for the protection of occupational hazards, accidents and disease. Details of compensation acts. **(3 Lectures)**
- Family planning objectives of National family planning methods. A general idea of advantages and disadvantages of the method. **(3 Lectures)**
- Mental Health- community aspects of mental health; role of physiotherapists, therapists in mental health problems such as mental retardation etc. **(3 Lectures)**
- Communicable disease-An overall view of the communicable disease. Classification according to the principal mode of transmission. Role of insects and their vectors. **(3 Lectures)**
- International health agencies. **(3 Lectures)**

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

NUTRITION
Course Code: PMS.211T
Credit Hours: 2
Semester: IV

- Introduction to science of nutrition
- Food pattern and its relation to health **(2 Lectures)**
- Factors influencing food habits, selection and food stuffs **(3 Lectures)**
- Food selection, storage & preservation **(3 Lectures)**
- Classification of nutrients – macronutrients and micronutrients **(3 Lectures)**
- Proteins – types, sources requirements and deficiencies of proteins **(3 Lectures)**
- Carbohydrates sources, requirements & efficiency **(3 Lectures)**
- Fats – types, sources, requirements, deficiency and excess of fats **(3 Lectures)**
- Water – sources of drinking water, requirements, preservation of water **(2 Lectures)**
- Minerals – types, sources, requirements deficiencies of minerals **(3 Lectures)**
- Vitamins – types, sources, requirements deficiencies of vitamins **(3 Lectures)**
- Planning diets including renal diets **(2 Lectures)**

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

OCCUPATIONAL SAFETY & HEALTH
Course Code: PMS.212T
Credit Hours: 2
Semester: IV

UNIT - I : Safety and Health Management (4 Lectures)

i. Occupational Health Hazards, Promoting Safety, Safety and Health training, Stress and Safety.

ii. Ergonomics - Introduction, Definition, Objectives, Advantages.

Ergonomics Hazards - Musculoskeletal Disorders and Cumulative Trauma Disorders.

- Organizing for safety, Health and Environment.
- Organization: Structure, Function and responsibilities
- Safety Committee: Structure and function

UNIT - II : Radiation and Industrial Hazards (5 Lectures)

i. Types and effects of radiation on human body, Measurement and detection of radiation intensity. Effects of radiation on human body, Measurement – disposal of radioactive waste, Control of radiation

ii. Industrial noise -Sources, and its control, Effects of noise on the auditory system and health, Measurement of noise ,

iii. Different air pollutants in industries, Effect of different gases and particulate matter ,acid fumes , smoke, fog on human health

iv. Vibration - effects, measurement and control measures

v. Industrial Hygiene.

UNIT –III: Electrical Hazards (5 Lectures)

Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection, Earthing standards and earth fault protection , Protection against voltage fluctuations, Effects of shock on human body Hazards from Borrowed nutrals, Electrical equipment in hazardous atmosphere, Criteria in their selection, installation, maintenance and use, Control of hazards due to static electricity,

UNIT – IV : Fire and Other Hazards (3 Lectures)

i. General causes and classification of fire, Detection of fire, extinguishing methods, fire fighting installations with and without water.

ii. Machine guards and its types, automation. High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and nondestructive testing, hazards and control in mines.

UNIT –V: Vibration and Noise (3 Lectures)

Activities related to vibrations, its impact on human health, abatement Sources, effects of noise on man, Measurement and evaluation of noise, Silencers, Practical aspects of control of noise

UNIT-VI: Theories & Principles of Accident Causation & Prevention (5 Lectures)

i. The effect of accident, unsafe act, unsafe condition, unpredictable performance, Human factors contributing to accidents - causes for unsafe acts,

ii. Safety and psychology -Theories of motivation and their application to safety. Consequences of accident, accident prevention programmers, Role of safety

Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc.

Accident Prevention : Theories / Models of accident occurrences, Principles of accident prevention, Accident and Financial implications.

UNIT-VII: First Aid (5 Lectures)

i. Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, Bleeding, Burns, Scalds and accidents caused by electricity, Respiratory problems, Rescue and Transport of Casualty. Cardiac massage, poisoning, wounds.

ii. Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

OCULAR (POSTERIOR SEGMENT & NEURO-OPHTHALMIC) DISEASE- II (THEORY)
Course Code: OPT.301T
Credit Hours: 3
Semester: V

UNIT – I **(5 Lectures)**

Diseases of the Vitreous Humor- Congenital Anomalies. Vitreous Opacities. Hereditary Vitreo – Retinal Degeneration's. Vitreous Haemorrhage .Detachment of Vitreous Humor . Vitreous Surgery . Methods of clinically assessing the posterior segment (direct & indirect opthalmoscopy)

UNIT – II **(5 Lectures)**

Disease of the Retina- Congenital & Dev. Defects. Inflammation of the Retina(Retinitis) . Retinal Vasculitis . Oedema of the Retina. Haemorrhage of the Retina. Vascular Occlusion . Retinal Arteriosclerosis. Retinopathies . Retinal Telangiectasis. Degeneration's of the Retina. Detachment of the Retina. Surgical Procedures for Retinal Detachment .Tumours of the Retina. Phakomatoses,.
Injuries of the Retina.

UNIT – III **(5 Lectures)**

Disease of the Optic Nerve- Congenital Anomalies. Papilloedema. Inflammation of the Optic Nerve(Optic-Neuritis). Ischaemic Optic Neuropathy . Optic Atrophy. Tumours of the Optic Nerve. Injuries of the Optic Nerve.

UNI T-IV **(5 Lectures)**

Symptomatic Disturbances of Visual Function – Visual Field Defects . Amblyopia. Amaurosis. Night Blindness. Day Blindness. Defects in Color Vision. Congenital Word Blindness. Malingering.

UNIT – V **(10 Lectures)**

Neuro –eye disease:

- Evaluation of optic nerve disease
- Clinical features of optic nerve dysfunction., Optic disc changes. Optic atrophy. Special investigation.
- Classification of optic neuritis
- Optic neuritis and demyelination
- Systemic features of multiple sclerosis, Special investigation. Optic neuritis.
- Other causes of optic neuritis
- Parainfectious optic neuritis. Infectious optic neuritis.
- Non-arteritic anterior ischaemic optic neuropathy
- Arteritic anterior ischaemic optic neuropathy
- Clinical features of giant cell arteritis. Special investigation. Arteritic anterior ischaemic optic neuropathy.
- Leber hereditary optic neuropathy
- Hereditary optic atrophies
- Kjer syndrome. Behr syndrome. Wolfram syndrome.
- Alcohol-tobacco amblyopia
- Drug-induced optic neuropathies

UNIT – VI **(3 Lectures)**

Papilloedem: Raised intracranial pressure - Causes. Hydrocephalus-Systemic features. Clinical features of papilloedema, Differential diagnosis.

UNIT – VII **(4 Lectures)**

Congenital optic nerve anomalies

Without neurological associations: Tilted disc,Optic disc drusen, Optic disc pit, Myelinated nerve fibers.

With neurological associations: Optic disc coloboma,Morning glory anomaly, Optic nerve hypoplasia., Aicardi syndrome,Miscellaneous anomalies.

UNIT – VIII **(4 Lectures)**

Pupillary Reaction: Abnormal pupillary reactions**,** Afferent pupillary conduction defects**,** Argyll robertson pupils**,** Differential dignosis of light-near dissociation**,** Adie pupil**,** oculosympathetic palsy (horner syndrome)

UNIT – IX **(4 Lectures)**

Nystagmus: Classifications**,** Causes**,** Physiological nystagmus, Motor imbalance nystagmus, Ocular nystagmus, nystagmoid movements.

UNIT – X **(5 Lectures)**

Supranuclear Disorder of Eye Movements: Conjugate eye movements**,** Saccadic movements,Smooth pursuit movements, Non-optical reflexes, Supranuclear gaze palsies**,** Horizontal gaze palsies, Vertical gazepalsies.

OCULAR (POSTERIOR SEGMENT & NEURO-OPHTHALMIC) DISEASE- II (PRACTICAL)

Course Code: OPT.301P

Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

BINOCULAR VISION & OCULAR MOTALITY (THEORY)
Course Code: OPT.302T
Credit Hours: 3
Semester: V

UNIT-I: Grades of Binocular Vision (10 Lectures)

- Simultaneous perception (first grade of binocular vision), fusion, steropsis (third grade of binocular single vision). Advantages of binocular vision. Visual direction and the horopter-visual direction,corresponding point and normal retinal correspondence, horopter, physiologic diplopia. Binocular fusion-panum's area,fixation disparity,theories of binocular fusion,synergy hypothesis of panum,local sign hypothesis of hering,eye movement hypothesis of helmholts,suppession hypothesis of du tour and verhoeff,physiologic basis of fusion.

UNIT-II: Dihoptic Stimulation (12 Lectures)

- Depth with fusion and depth with diplopia, diplopia without depth,retinal rivary and suppretion,binocular lusure. Stropsis-physiologicalbasis of stereopsis,local and global stereopsis and fusion,stereopsis acuity neurophysiology of stereopsis. Depth perception-steropsis,nonstereoscopic cluesto yhe perception of depth under binocular condition,monocular clues (non stereoscopic clues to spetial orientation)-parallactic movements, linear perspectiveoveriay of contours,sizedistance from horizon ,distribution of highlights, shadow, shades and light .aerial perspective ,influence of accommodation and convergence on depth perception, conclusion. Integration of the motor and sensory system into binocular vision.

UNIT-III: Binocular Defects (12 Lectures)

- *Binocular optical defects*-anisometropia-vision in anisometropia,treatment, Binocular optical defects-aniseikoniasymtoms , clinical investigatoin,treatment. Binocular muscular co-ordination-orthophoria-binocular vision. Binocular muscular anomalies-heterophoria-the causes of imbalance ,exophoria, esophoria, hyperphoria, cyclophoria, symptoms of heterophoria, treatment. Binocular muscular anomalis-heterotropia—the vision in concomitant strabismus, treatment. Binocular muscular co-ordination-convergence-voluntary and reflex convergence, reflex convergence, the measurement of convergence, the relation between accommodation and convergence, binocular accommodation, fatigue of convergence. Binocular muscular anomalies-anomalies of convergence and other reading difficulties—insufficiency of convergence, convergence excess, the ophthalmologist and the reading ability of children.

UNIT-IV: Binocular Vision Test (16 Lectures)

- Test for simultaneous macular perception, test for fusion, test for stereopsis-synoptophore or stereoscope test, vectograph test, titmus stereo test, randomdot sterogram test, simple motor task test based on stereopsis.
- *Eye movements:* the orbit anatomy of the extraocular muscles. Interactive dynamics of orbital mechanisms & brain stem neurophysiology – out line of extra ocular muscle control. Extra ocular muscles-their function & nerve supply. Mechanics of actions of extra ocular muscles -cross sectional area of muscle, length of muscle. Arc of contact, muscle plane, Muscle axis of rotation.
- *Ocular movements* - Monocular Movements (Adduction, Abduction, supraduction, Infraduction, Incycloduction, excycloduction). Binocular Movements –VERSIONS- (saccadic & pursuit movement, position maintenance movements, stabilization movements & their characteristics). VERGENCES – (Convergence, divergence, vertical vengeance), Supra nuclear control of eye movements.(the superior colliculi, the occipital cortex, the psycho optical reflexes & fixation.
- *Oculomotor system:* vestibular – ocular reflexes, optokinetic reflexes. Diagnosis & clinical aspects of ocular anomalies & disorders. Converge through a spectacle lens. Prismatic effects in spectacle lenses.

BINOCULAR VISION & OCULAR MOTALITY (PRACTICAL)
Course Code: OPT.302P
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONTACT LENS-I (THEORY)
Course Code: OPT.303T
Credit Hours: 4
Semester: V

UNIT – I **(11 Lectures)**

- Contact lens history & development. Benefits of contact lens over spectacle. Manufacturing methods-spin cast, Lethe cut, Cast modeling.

UNIT –II **(12 Lectures)**

- Slit lamp Examination technique
- Corneal topography- Keratometry & Extended Keratometry

UNIT – III **(12 Lectures)**

- Contact lens optics-Contact lens & spectacle lens. Back vertex calculation. Contact lens & Tear lens system.

UNIT – IV **(10 Lectures)**

- Classification of contact lens & its material (soft & RGP); Material property.
- Contact lens terminology. RGP & soft lens design. FDA classification of contact lens material.

UNIT – V **(15 Lectures)**

- Patient selection & prescreening. Indications & contra indications of contact lens.
- Soft spherical contact lens fitting & Assesment.
- Soft contact lens case & maintenance.
- Spherical RGP contact lens fitting & assessment.
- RGP contact lens care & maintenance.

CONTACT LENS-I (PRACTICAL)
Course Code: OPT.303P
Credit Hours: 2

- Routine clinical procedure for contact lens patient & selection of contact lens.
- Keratometry & slit lamp Biomicroscopy.
- Spherical soft & Spherical RGP contact lens fitting: selection of contact lens Base curve, diameter & Power & fitting Assessment.
- Insertion & Removal of soft & RGP contact lens.
- Contact lens & maintenance.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CLINICAL EXAMINATION OF VISUAL SYSTEM (THEORY)
Course Code: OPT.304T
Credit Hours: 4
Semester: V

UNIT – I **(10 Lectures)**

- History of the Ophthalmic subject, Ocular symptoms, The past prescription – its influence
- Visual acuity testing – distance and near and colour vision
- Examination of muscle balance

UNIT – II **(20 Lectures)**

- *Slit lamp examination:*
- Examination of eye lids, conjunctiva and sclera
- Examination of cornea
- Examination of iris, ciliary body and pupil
- Examination of lens
- Examination of intraocular pressure and examination of angle of anterior chamber

UNIT – III **(30Lectures)**

- Ophthalmoscopy – Direct and Indirect
- Examination of fundus (vitreous and disc), (choroids and retina)
- Examination of lacrimal system
- Examination of the orbit
- Macular function test
- Visual field charting (central), (peripheral).
- Neuro – ophthalmological examination

CLINICAL EXAMINATION OF VISUAL SYSTEM (PRACTICAL)
Course Code: OPT.304P
Credit Hours: 2

- Examination of eye lids, conjunctiva and sclera
- Examination of cornea
- Examination of iris, ciliary body and pupil
- Examination of lens
- Examination of intraocular pressure and examination of angle of anterior chamber
- Ophthalmoscopy – Direct and Indirect
- Examination of fundus (vitreous and disc), (choroids and retina)
- Examination of lacrimal system
- Examination of the orbit
- Macular function test

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

HEALTHCARE
Course Code: PMS.305T
Credit Hours: 2
Semester: V

UNIT-I: Introduction to Health (10 Lectures)

- Definition of health, determinants of health, health indicators of India, health team concept.
- National health policy
- National health programmes (Briefly objectives and scope)
- Population of India and family welfare programme in India

UNIT-II: Introduction to Nursing (15 Lectures)

- What is nursing? Nursing principles, inter-personnel relationships.
- *Bandaging:* basic turns, bandaging extremities, triangular bandages and their application.
- Nursing position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- *Lifting and transporting patients:* lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.
- Bed side management: giving and taking bed pan, urinal.
- Observation of stools, urine, sputum
- Use and care of catheters, enema giving.
- *Methods of giving nourishment:* feeding, tube feeding, drips, transfusion.
- Recording of body temperature, respiration and pulse.
- Simple aseptic techniques, sterilization and disinfection.
- *Surgical dressing:* observation of dressing procedures.

UNIT-III: First Aid (15 Lectures)

- Physical Exam and SAMPLE History
- Documentation and Legal Considerations
- Sudden Illness, Bleeding
- Caring for Shock, Burns, Injuries to muscles, bones, and joints, Splints, Bites and Stings
- Administering Epinephrine
- Assisting with bronchodilators (inhalers)
- Heat/Cold Related Emergencies
- In-line stabilization for head, neck and back injuries
- First Aid Kits, Fire & safety

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

DIETARY MANAGEMENT OF COMMON DISEASES
Course Code: PMS.306T
Credit Hours: 2
Semester: V

UNIT – I **(10 Lectures)**

- Diet Therapy: Routine hospital diet, Regular diet, Light diet, Soft Diet, Full liquid diet.
- Diet in fevers and infections – Typhoid, Malaria and Tuberculosis.
- Diet in gastro intestinal disorders: Diarrhea, Constipation, Peptic ulcer

UNIT – II **(20 Lectures)**

- Diet in Diabetes mellitus – Classification, predisposing factors, Diagnosis, Dietary management.
- Diet in Cardiovascular diseases – Dietary management in atherosclerosis and hypertension.
- Diet in diseases of liver and gall bladder.
- Diet in Renal diseases
- Dietary Management in glomerulonephritis
- Dietary Management in Acute and chronic renal failure.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

LOW VISION AIDS & VISUAL REHABILITATION (THEORY)
Course Code: OPT.307T
Credit Hours: 3
Semester: VI

UNIT – I **(10 Lectures)**

- Definition-old, new, proposed
- Grades of low vision
- Statistics/ Epidemiology
- Relation between disorder, impairment & handicapped

UNIT – II **(40 Lectures)**

- *Low vision optics:*
- Magnification-relative distance/ relative size/ approach/angular
- Optics of Galilian & Keplarian telescope- advantage/disadvantage, significance of exit & entrance pupil.
- Optics of spectacle magnifier/ determination/ calculation/ disadvantage/advantage.
- Optics of stand magnifier, significance of equivalent viewing distance & calculations.
- Telescope- distance/ near/ telemicroscope/ monocular/ binocular/ bioptic.
- Determination of decentration of lenses /prism/calculation/Lebenson's formula/simple diotric formula.
- Hand held magnifier-illuminated/ non-illuminated.
- Spectacle magnifier / half eye/ prism correction/ bar magnifier/ CCTV/ magni-cam/ low vision imaging system or V-max / contact lens & IOL telescope.
- *Low vision examination:*
- Task/ Goal oriented history-medical/ visual/ psychological history/ task analysis/ mobility / distance vision/ near vision / daily living/ illumination/ work & school.
- Visual acuity measurement-distance/ near/ use of log MAR chart (distance & near)/ light house, picture chart/ visual field/ Amsler chart/ contrast sensitivity/ overview of glare testing.
- Low vision refraction.
- Assessment & prescription of low vision devices-optical/ non-optical/ rehabilitation services.
- Non- optical devices-pen/umbrella/ boldline note book/ illumination/ letter writer/ environmental modification/ signature guide/ needle threader/ eccentric viewing strategies.
- Overview of Rehabilitation Services:- definition/ implementation/ vocational guidance/ educational guidance/ mobility & orientation training / special teacher/ special school/ Braille system/ integrated system/referral center- activity/ support/ loan.
- Overview of systematic / retinal diseases in relation to low vision:- acromatopsia/ LMBB syndrome/ labers congenital anomaly/ down syndrome/ retinitis pigmentosa/ diabetic retinopathy/ optic atrophy/ albinism/ aniridia.
- Counseling of low vision patient/ parents/ guardians/relatives.

LOW VISION AIDS & VISUAL REHABILITATION (PRACTICAL)
Course Code: OPT.307P
Credit Hours: 1.5

- Case history
- Assessment
- Application of devices
- Rehabilitation

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

LAW & OPTOMETRY AND OCCUPATIONAL OPTOMETRY (THEORY)
Course Code: OPT.308T
Credit Hours: 3
Semester: VI

SECTION-I: LAW & OPTOMETRY (15 Lectures)

- Legal environment and techniques – history – law and equity
- History and theory of licensure
- Licensure as a means of internal and external discipline – unprofessional conduct incompetence – gross immorality
- International Optometry – important foreign optometry law
- The Optometrist in court
- Malpractice – Theory of Liability – damages – minimizing malpractice claims
- Insurance & Negligence
- Ethics – professional ethics
- Laws governing practice of medical profession and para-medical profession In India
- Registered medical practitioner – laws against practice of medicine of those unregistered – Medical Council of India – Dental Council – Nursing council
- Present rules and regulations – Laws regarding optical product manufacturers – dispensing in India.

SECTION-II: OCCUPATIONAL OPTOMETRY (35 Lectures)

- 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.
- *Acts and Rules:* Factories Act and Rules- Workmen's Compensation Act – ESI Act, etc
- Occupational diseases/ occupation related diseases caused by – physical agents, chemical agents and biological agents
- Occupational hygiene, environmental monitoring
    - Recognition, evaluation and control of hazards
    - Illumination – definition, measurements and standards
- *Occupational safety:*
    - Causes of accidents
    - Vision, lighting, colour and their role
    - Accident analysis & Accident prevention
- *Ocular and visual problems of occupation:* Electromagnetic radiation, Ionizing, Non-ionizing (Infra red, Ultra violet, Microwave, Laser)
    - Injuries – Mechanical, chemical
    - Toxicology – Metals, chemicals
- *Prevention of occupational diseases*
    - Medical examination / medical monitoring
    - Pre-employment / pre-placement
    - Periodic
- Personal protective equipment
    - General

- Goggles, face shields, etc
- Selection and use
- Testing for standards

- Standards, Visual standards for jobs
- Visual display units (terminals) - -VDU/VDT
- Pesticides – general and visual and ocular defects
- Role of Optometrists – promotion of general and visual health and safety of people at work

LAW & OPTOMETRY AND OCCUPATIONAL OPTOMETRY (PRACTICAL)
Course Code: OPT.308p
Credit Hours: 1.5

- Conducted as per theory syllabus

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	Marks
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

CONTACT LENS-II (THEORY)
Course Code: OPT.309T
Credit Hours: 4
Semester: VI

UNIT – I **(8 Lectures)**

- Contact lens fitting in astigmatism.
- Contact lens fitting in keratokonus.
- Contact lens fitting in children.

UNIT –II **(8 Lectures)**

- RGP lenses – low D.K. and high D.K. lenses.
- Instructions regarding handling and care of lenses.

UNIT – III **(7 Lectures)**

- Cosmetic and prosthetic contact lenses.
- Extended wear lenses versus Daily wear

UNIT – IV **(8 Lectures)**

- Disposable lenses
- Contact lens – Toric, Bifocal, Multifocal.
- Therapeutic lenses / Bandage lenses.

UNIT – V **(7 Lectures)**

- Contact lens solutions – principle of action, compositions
- Ordering contact lenses – writing prescription to the lab.

UNIT – VI **(7 Lectures)**

- Contact lens – modifications of finished lenses (RGP).
- Checking the parameters.

UNIT – VII **(7 Lectures)**

- Recent advances in contact lenses.
- Follow up examinations

UNIT – VIII **(8 Lectures)**

- Contact lens complications and their management.
- Prosthetic eye fitting procedures & conformers

CONTACT LENS-II (PRACTICAL)
Course Code: OPT.309P
Credit Hours: 2

- Fitting and assessment of contact lenses – steep, flat, optimum on spherical cornea.
- Fitting and assessment of contact lenses – steep, flat, optimum on toric cornea with spherical lenses.
- Fitting and assessment of contact lenses – steep, flat, optimum on toric cornea with toric lenses.
- Teaching the patient to insert and remove contact lenses.
- Writing Contact Lens prescriptions.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SCHEME OF EXAMINATION - PRACTICALS

	Particulars	**Marks**
INTERNAL	Log Book	10
	Clinical Posting(attendance)	20
	Internal (1st ,2nd Hourly & mid-term)	20
EXTERNAL	Viva-voce	50
	TOTAL MARKS	**100**

PUBLIC HEALTH & COMMUNITY OPTOMETRY
Course Code: OPT.310T
Credit Hours: 2
Semester: VI

UNIT – I **(5 Lectures)**

- Concept of public health.
- Principles of primary, secondary and tertiary care.

UNIT – II **(15 Lectures)**

- Planning of health services.
- Health economics
- Health manpower development
    - Basic O.T Practices
    - Familiarity with use of Operating Microscope
- NPCB and refractive blindness – optometrist's role as primary health care provides.
- Health cares insurance including role of TPA.

UNIT – III **(10 Lectures)**

- ***Ocular emergencies :***
    - Foreign body
    - Eye Pain
    - Watering
    - Injuries-perforating, non perforating & chemical

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**

SYSTEMIC CONDITIONS & THE EYE
Course Code: OPT.311T
Credit Hours: 2
Semester: VI

UNIT – I **(3 Lectures)**

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

UNIT – II **(3 Lectures)**

Diabetes mellitus N: Pathophysiology, classification, clinical features, diagnosis, complications, management. Diabetes mellitus and the eye.

UNIT –III **(3 Lectures)**

Acquired Heart Disease : Embolism, Rheumatic heart disease, Sub acute bacterial endocarditis. Heart disease & the eye.

UNIT-IV **(3 Lectures)**

Malignancy: Definitions, nomenclature, characteristics of benign & malignant neoplasm's. Grading and staging of cancer, diagnosis, principles of treatment. Neoplasia and the eye.

UNIT – V **(3 Lectures)**

Connective Tissue Disease - Anatomy and pathophysiology: Arthritis. Eye and connective tissue disease.

UNIT – VI **(3 Lectures)**

Thyroid Disease: Classification of thyroid disease. Diagnosis, complications, clinical features, management of thyroid disease involving eye.

UNIT – VII **(3 Lectures)**

Tuberculosis: Etiology, clinical features, pulmonary TB, diagnosis, , treatment of tuberculosis involving the eye.

UNIT – VIII **(3 Lectures)**

Vitamin deficiency and the eye

UNIT – IX **(3 Lectures)**

Neurological disease and the eye: Demyelinating diseases, Visual pathway lesions, Papiloedema.

UNIT – X **(3 Lectures)**

Genetic disorders and the eye.

SCHEME OF EXAMINATION - THEORY

Types of Questions	Total No. of Questions	No. of Questions to be attempted	Marks Assigned	Subtotal
SEC -A: MCQ'S	10	10	1	10
SEC -B: Very Short Answer Questions	7	5	2	10
SEC -C: Short Answer Questions	6	4	5	20
SEC -D: Long Answer Questions	2	1	10	10
			TOTAL MARKS	**50**