Department of Paramedical Sciences

Faculty of Allied Health Sciences

SGT UNIVERSITY

Shree Guru Gobind Singh Tricentenary University

Gurgaon-122505

Syllabus

Bachelor of Optometry (B.OPT)

Duration: 4 years (8 Semester)

W.e.f. Academic Session 2020-21

PREAMBLE:-

Optometry is a health care profession that is autonomous and concerned especially with examining the eye for refractive errors, with prescribing correctional lenses, eye exercises and/or visual rehabilitation care for visually impaired, with diagnosing diseases of the eye, and with treating such diseases or referring them for treatment.

Optometry as a profession has the primary public health responsibility for eliminating uncorrected refractive error (the leading cause of vision impairment globally). As primary eye care practitioners, optometrists have a vital role in detecting potentially serious eye diseases such as cataract, glaucoma and Diabetic retinopathy, age-related maculopathy, as well as general health conditions such as hypertension and diabetes, which means optometrists can also help alleviate the burden of other causes of blindness through diagnosis, referral and in some cases co-management. Optometry can and should play a leading role in eye care provision at the primary level, and can also assist at secondary and tertiary levels where possible, working with ophthalmologists and other eye care providers towards the unified goal of combating blindness.

Optometrists are primary health care practitioners of the eye and visual system who provide comprehensive eye and vision care, which includes refraction and dispensing, detection/diagnosis and co-management of disease in the eye and the rehabilitation of conditions of the visual system.

The graduate program gives exposure to various fields of Optometry i.e. Contact Lenses, Binocular Vision, Low Vision and Sports Vision.

This graduate program introduced by Faculty of Allied Health Sciences (SGT University) prepares healthcare professionals having extensive and practical knowledge in the fields of Optometry on Local, National, and International fronts.

GOALS:

The primary goal of the Optometry graduate program is to train Optometrists with the knowledge, skills and competency to provide optimum quality professional services in a wide variety of settings including academic, governmental, corporate, and military and community based organizations.

OBJECTIVES:

- The primary goal of the Optometry graduate program is to train Optometrists with the knowledge, skills and competency to provide optimum quality professional services in a wide variety of settings including academic, governmental, corporate, and military and community based organizations.

Duration of Study:

Bachelor- Four years program (eight semesters) (full-time experiential rotations in various aspects of professional practice in the field) with Choice Based Credit System.

Eligibility:

Bachelor - 10+2 with Physics, Chemistry & Biology/Maths from approved & accredited any board.

Lateral Entry Eligibility:

Passed 2 years diploma in Optometry after 12^{th} standard

Career opportunities

- Can work in a clinical setting like hospitals or clinics
- Can work in a corporate setup
- Can work in government sector

- Are eligible to open an independent setup

Core Department:

Department of Optometry with support from Ophthalmology

Teaching strategies:-

The interdisciplinary curriculum is based on both a clinical and public health model for practice. The major focus is on population aggregates rather than individuals and indirect rather than direct care to clients. Fellows are prepared to participate in a multi-disciplinary approach to planning, implementing, managing, and evaluating programs and services for worker health and safety.

It is assumed that there will be approximately **teaching hours** in four year period of course. Out of these, Theory teaching (Modules) will be of **hours** and Practical will be of **hours**.

The fellows will be exposed to practical demonstration in various Industries for above purposes

Heads	**Semester wise**	**Total hour/ Year**
Project	150hours/ semester	300
Home assignment: Any 3 assignments per semester as given in modules (only one from each module).	10 hours for each assignment (30 hours/semester)	60
Participative learning	150 hours /semester	300
Total	**330 hours/semester**	**660**

The theory training will be primarily from cognitive domain while practical training will be from cognitive, psychomotor and affective domain.

Course distribution: The Graduation program will be of four years duration. It will be divided into three equal terms of one year each.

TOPIC (Subject wise)	**HOURS**	**CREDIT HOURS**
The topics covered in first year will include		
Modular teaching modules	560 hours	190
Assignments	30 hours	10
Participative learning	480hours	160
TOTAL TEACHING HOURS	**1070 hours**	**360**
The topics covered in second year will include		
Modular teaching modules	480 hours	160
Assignments	30 hours	10
Participative learning	480hours	160
TOTAL TEACHING HOURS	**990 hours**	**330**

The topics covered in third year will include		
Modular teaching modules	560 hours	190
Assignments	30 hours	10
Participative learning	480hours	160
Project	30 hours	10
TOTAL TEACHING HOURS	**1200 hours**	**390**

Subsidiary subjects are added for overall development of students and to enhance their knowledge.

Professional /Clinical Training

- Students are expected to complete 1 year internship with corporate hospitals/ SGT university
- Students will have to observe the protocols on different modalities.
- Students form the first point of contact for patient examinations.
- Students will have to carry out various examinations under the supervision of senior & healthcare staff.

Research Project

- Students should complete a research project investigating a topic of interest to them in optometry.
- This research should lead to paper/ poster presentation at a professional meeting and/ or an article for publication

Internship:

The students will be given assignments/project for which they will be required to undergo training at the hospital. The students will be asked to present their project/work report on coming back after their training. This will be reflected in their evaluation for internal assessments. Due support to the students will be provided for this training by the faculty.

Bachelor of Optometry
Scheme of Examination

First Semester

	Paper Code	Theory Examination		*Practical Examination*		*Total Marks*	*Credits*
		Univ. Exam.	Internal Assessment	Univ. Exam.	Internal Assessment		
Human Anatomy		60	40	-	-	100	4
Human Physiology		60	40	-	-	100	4
General Microbiology & Pathology		60	40	-	-	100	4
Physical and Geometrical Optics		60	40	30	20	150	4+2
Communication Skills and Personality Development		60	40	-	-	100	2
Total		**300**	**200**	**30**	**20**	**550**	**20**

Second Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assessment	Univ. Exam.	Internal Assess Ment		
Ocular Anatomy, Physiology & Biochemistry		60	40	-	-	100	4
Ocular Pharmacology		60	40	-	-	100	4
Clinical Examination of Visual System		60	40	30	20	150	4+2
Visual optics-1		60	40	30	20	150	4+2
Fundamentals of Computer Science		60	40	-	-	100	2
Total		**300**	**200**	**60**	**40**	**600**	**22**

Third Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assessment	Univ. Exam.	Internal Assessment		
OcularDiseases-1		60	40	-	-	100	4
Optometric Instruments-1		60	40	30	20	150	4+2
Visual Optics—2		60	40	30	20	150	4+2
Public Health and Community Optometry		60	40	-	-	100	4
Medical Psychology		60	40	-	-	100	4
Environmental Science		60	40	-	-	100	4
Medical Emergencies & Patient Care		60	40	-	-	100	4
Total		**420**	**280**	**60**	**40**	**800**	**32**

Fourth Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assessment	Univ. Exam.	Internal Assessment		
Ocular Disease-2		60	40	------	------	100	4
Optometric Instruments -2		60	40	30	20	150	4+2
Binocular Vision and Orthoptics-1		60	40	30	20	150	4+2
Investigations in clinical ophthalmology-1		60	40	30	20	150	4+2
Contact lens-1		60	40	30	20	150	4+2
Total		**300**	**200**	**120**	**80**	**700**	**28**

Fifth Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assessment	Univ. Exam.	Internal Assessment		
Investigations in clinical ophthalmology -2		60	40	30	20	150	4+2
ContactLens-2		60	40	30	20	150	4+2
Dispensing Optics		60	40	30	20	150	4+2
Binocular Vision and Orthoptics-2		60	40	30	20	150	4+2
Research Methodology and Biostatistics		60	40	.	-	100	4
Hospital Management & Medical Ethics		60	40	-	-	100	4
Total		**360**	**240**	**120**	**80**	**800**	**32**

Sixth Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assess-ment	Univ. Exam.	Internal Assess-Ment		
Low Vision Aids		60	40	30	20	150	4+2
Eye Banking & Management of OT		60	40	-	-	100	4
Technical Writing		-	100	-	-	100	4
Occupational Optometry		60	40	-	-	100	4
Pediatric& Geriatric Optometry		60	40	-	-	100	4
Total		**240**	**260**	**30**	**20**	**550**	**22**

Seventh Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assess-Ment	Univ. Exam.	Internal Assess-Ment		
Comprehensive Eye care & Refraction- Clinics		-	-	-	100	100	4
Optometric procedures and instruments		-	-	-	100	100	4
Primary Eye Care- Clinics		-	-	-	100	100	4
Total		**-**	-	**-**	**300**	**300**	**12**

Eighth Semester

	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
		Univ. Exam.	Internal Assess-ment	Univ. Exam.	Internal Assess-Ment		
Retina, Glaucoma & Low vision- Clinics		-	-	-	100	100	4
Pediatric Optometry & Binocular Vision- Clinics		-	-	-	100	100	4
Cornea & contact lenses- Clinics		-	-	-	100	100	4
Project dissertation		-	-	-	100	100	7
Total		-	-	-	**400**	**400**	**19**

Bachelor of Optometry, 1st year
First Semester
Human Anatomy

Total Marks- 60 **Paper code -** **Hours- 50**

S.No.	Topics To Be Covered	Teaching Hours
UNIT-1	**Introduction: human body as a whole** Definition of anatomy and its subdivisions Anatomical nomenclature and terminology (planes &positions) Surface Anatomy of main structures and vessels	4
	Applied anatomy& Joints Musculoskeletal system Connective tissue & its modification, tendons, membranes, special connective tissue. Bone structure, blood supply, growth, ossification, and classification. Muscle classification, structure and functional aspect. Joints classification, structures of joints, movements, range, limiting factors, stability, blood supply Nerve supply, dislocations and applied anatomy	4
UNIT- 2	**Extremity (Lower & Upper extrimities)** Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy	4
	Lower extremity Bony architecture Joints – structure, range of movement Muscles – origin, insertion, actions, nerve supply Major nerves – course, branches and implications of nerve injuries Development of limb bones, muscles and anomalies Radiographic identification of bone and joints Applied anatomy	4
UNIT- 3	**Spine and thorax** Back muscles -Superficial layer Deep muscles of back, their origin, insertion, action and nerve supply. Vertebral column – Structure & Development, Structure & Joints of vertebra. Thoracic cage	4
	Head and neck: Cranium Facial Muscles – origin, insertion, actions, nerve supply Temporal mandibular Joints – structure, types of movement	4

UNIT- 4	**Cardiovascular system (with relevant applied anatomy)** Heart-Size,location, chambers. Circulation -Systemic &pulmonary Great vessels of the heart, branches of aorta. Overview of blood vessels of upper extremity and lower extremity	4
	Lymphatic system- (with relevant applied anatomy) Salient features of lymphatic organs (spleen, tonsil, thymus, lymph node)	4
UNIT- 5	**Gastro-intestinal system (with relevant applied anatomy)** Partsofthe gastrointestinal tract Gross anatomy of Tongue, stomach, small and large intestine, liver, gall bladder Pancreas and other digestive organ& related applied anatomy	4
	Respiratory system (with relevant applied anatomy) Partsof respiratory system with salient gross features of lung Brief description of intercostal muscles andPara-nasal air sinuses	4

Bachelor of Optometry, 1st year
First Semester
Human Physiology

Total Marks- 60 **Paper code -** **Hours- 50**

UNIT-1	General Physiology Cell: morphology, Structure and function of cell organelles Structure of cell membrane	2
	Transport across cell membrane Intercellular communication Homeostasis	2
	Blood Introduction-composition & function of blood	2
	W.B.C., R.B.C., Platelets formation & functions, Immunity	1
	Plasma: composition, formation & functions, Plasma Proteins: -types & functions, Blood Groups-types, significance, determination.	2
	Hemoglobin, Haemostasis	2
	Lymph-composition, formation, circulation & functions	2
UNIT-2	Cardiovascular system Conducting system-components, impulse conduction Heart valves Cardiac cycle-definition, phases of cardiac cycle,	2
	Cardiac output-definition, normal value, determinants.	1
	Stroke volume and its regulation.	2
	Heart rate and its regulation: Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure.	2
	Shock-definition, classification, causes and features, Basic idea of ECG, Cardiovascular changes during exercise	2
UNIT-3	Respiratory System Mechanics of respiration Lung volumes and capacities	2
	Pulmonary circulation, transport of respiratory gases	2
	Factors affecting respiration, Regulation of respiration-neural regulation, voluntary control and chemical regulation	2
	Hypoxia, Hypercapnoea, Hypocapnoea,	1
	Artificial respiration	1
	Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, Tachypnoea, Respiratory changes during exercise.	2
UNIT-4	Digestive System Digestion & absorption of nutrients, Gastrointestinal secretions & their regulation Functions of Liver & Stomach	2
UNIT-5	Nervous system Introduction, central and peripheral nervous system, functions of nervous system.	1

	Reflexes-monosynaptic, polysynaptic, superficial, deep &withdrawal reflex Sense organ, receptors, electrical& chemical events in receptors.	2
	Sensory pathways for touch, temperature, pain, proprioception & others.	2
	Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions.	1
	Motor mechanism: motor cortex, motor pathway: the descending tracts - pyramidal & extrapyramidal tracts-origin, course, termination & functions. Upper motor neuron and lower motor neuron paralysis. Special senses-eye, ear, nose, mouth	2
	Water excretion, concentration of urine-regulation of Na+, Cl-, K+ excretion	1
	Nerve Muscle Physiology Muscles-classification, structure, properties, Excitation, contraction, coupling, Motor unit, EMG, factors affecting muscle tension, Muscle tone, fatigue, exercise .	2
	Nerve – structure and function of neurons, classification, properties Resting membrane potential & Action potential their ionic basis, All or None phenomenon Neuromuscular transmission Ionic basis of nerve conduction.	2
	Concept of nerve injury &Wallerian degeneration Synapses. Electrical events in postsynaptic neurons Inhibition & facilitation at synapses .	2
	Chemical transmission of synaptic activity Principal neurotransmitters. Chemical transmission of synaptic activity Principal neurotransmitters.	1

Bachelor of Optometry, 1st year
First Semester
General Microbiology & Pathology

MICROBIOLOGY

UNIT-I

Safety measures in laboratory

Sterilization and Disinfection: Physical Methods of Sterilization, Chemical Methods of Sterilization, Methods of Disinfection

Normal microbial flora of human body, role of normal flora

UNIT-II

Introduction and morphological features of Bacteria, Fungi, Viruses, Parasites, Microbial pathogenicity

Brief Introduction of morphology and diseases associated with of, Streptococcus pneumoniae, Mycobacterium, Aspergillus, Tinea, Mycetoma, Cryptococcus.

PATHOLOGY

UNIT-III

Basic Pathology: Pathology & its branches

Normal cell and its functions, Various types of microscope & light microscope in details.

UNIT-IV

Formation of Blood, Composition and functions of blood, Various anticoagulants, their uses, mode of action and their merits & demerits.Normal hematological indices (MCV, MCH, MCHC, PCV)

Normal and absolute values in hematology, ESR & Factors influencing ESR and various procedures for its estimation

Bachelor of Optometry, 1st year
First Semester
Physical & Geometrical Optics

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Elementary basis of light-Basic idea about Refraction, Reflection, Interference, diffraction, polarization, spectrum of light, Law of inverse square
Lens Shapes -Convex, Concave, Spherical, Cylindrical &Toric surfaces, Aspheric surfaces, Thin Lens equation, thick lens equation, Front and back vertex power, Determination of focal length & dioptric power of lens

Unit-II

Strum's Conoid
Neutralization of lenses, Combination of lens, Notation of lenses, Image formation by Concave and Convex lenses, How to check power of unknown lens
Effectivity of lens, Gauss theorem

Unit-III

Aberrations of lenses and eyeball
Prisms -definition, uses, nomenclature, How to detect and measure power of a prism, Compounding and resolving prism powers
Prismatic effect &Decentration, Prentice rule

Unit-IV

Focimeter
Optical Centre & Axis Marking by focimeter
Simple & Toric transposition

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Identification of different types of lenses
2. Neutralization of lenses
3. Focimeter
4. How to record vision, use of Pin hole, Slit

Bachelor of Optometry, 1st year
First Semester
Communication Skill & Personality Development

Total: 40 hours

Unit I
Listening Comprehension

- Speeches
- Interviews
- audio-video clippings followed by exercises
- Introduction to Communication
- Importance of Communication
- Barriers to Communication and ways to overcome them

Unit II
Conversation Skills

- Greetings and introducing oneself
- Framing questions and answer
- Role play
- Buying: asking details etc
- Word formation strategies
- Vocabulary building: Antonyms, Synonyms, Affixation, Suffixation, One word substitution

Unit III
Reading Comprehension

- Simple narration and Stories
- Simple Passages
- Newspaper and articles clippings
- Note Making
- Paragraph Writing
- Comprehension
- Report Writing: types, characteristics
- Introduction to Letter Writing

Unit IV:
Pronunciation

- Pronunciation

- Syllable and Stress
- Intonation and Modulation

UNIT V

Writing Comprehension

- Letters: types, format, style
- Précis Writing
- Paragraph: Order, Topic sentence, consistency, coherence
- Report and Proposal

Project Writing: Features, Struct

Bachelor of Optometry, 1st Year
Second Semester
Ocular anatomy, Physiology & Biochemistry

--60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Different parts of eyeball and their functions
Embryology of the eye in general
Orbit and its immediate relations, walls of orbit, fissures and foramina, anatomical spaces of orbit
Lids--Layers of eyelids, lid glands and their functions, muscles of eyelids
Lacrimal apparatus, Tear film and pH

Unit-II

Conjunctiva-Parts and glands of conjunctiva
Cornea -Transparency of cornea, metabolism of cornea, Layers of cornea and conjunctiva
Sclera-Anatomy of sclera
Uveal Tract—Gross anatomy of iris, choroid and ciliary body and their functions, Intra-ocular muscles
Pupil-Different types of pupillary reflexes and their pathway- Light reflex, near reflex, psycho-sensory reflex
Anterior Chamber--Formation and drainage and functions of aqueous humor, Structures of angle of AC
Lens and Vitreous—Anatomy, transparency and Metabolism of lens, Anatomy and functions of vitreous
Retina and Optic Nerve-Anatomy of retina and visual pathway, Physiology of vision, color vision
Ocular Muscles-Extra-Anatomy and Physiology of extra-ocular muscles, Movements of eyeball, concept of BSV
Nervous and Vascular supply of eyeball-- Sympathetic and parasympathetic nervous system in relation to eyeball.

Unit-III

General metabolic processes occurring in different parts of eyeball—Krebs's Cycle, Glycolysis, Sorbitol Pathway. General biochemical tests like Hemoglobin, Glycosylated Hemoglobin, LFT, KFT, Lipid profile, Thyroid function tests, Blood sugar

Unit-IV

Visual acuity Principles and visual perception
Intra-Ocular pressure
Visual field

Bachelor of Optometry, 1st Year
Second Semester
Ocular Pharmacology

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-1

Ocular Pharmacology – An introduction
Autonomic nervous system
Routes of drug administration

Unit-II

Miotics, Mydriatics & Cycloplegics drugs
Ophthalmic dyes
Local Anaesthetics
Ophthalmic preservatives
Ocular lubricants
Ocular irrigating solutions
Ocular antiseptics & disinfectants
Visco elastic agents

Unit-III

Antibacterial drugs
Antifungal drugs
Anti-Viral drugs
Anti-inflammatory drugs
Anti-allergic agents
Immunosuppressive agents

Unit-IV

Anti-glaucoma drugs
Anti-cataract agents
Contact lens solution
Chelating agents

Bachelor of Optometry, 1st Year
Second Semester
Clinical Examination of Visual System

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

History Taking of ophthalmic patient—Chief complaints, History of present illness, H/o Past illness, Family history, Personal history, Treatment history, Menstrual history with examples and relevance.

Unit-II

Visual acuity testing, Vision with and without glasses, for distance and near
Examination of muscle balance
Examination of Lacrimal system, Orbit

Unit-III

Examination of Eyelids, conjunctiva, cornea, Iris, Pupil Lens,
IOP measurement and Gonioscopy
Examination of fundus with Direct, Indirect ophthalmoscope
Macular function tests
Visual field charting
Neuro-ophthalmological examination

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

OPD and IPD posting of students and training how to take history and examine a patient. Refraction under supervision

Bachelor of Optometry, 1st year
Second Semester
Visual Optics-1

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Review of geometrical optics—Light and its properties, Vergence and power, Sign convention, Catoptric imagery, Magnification and field of view of a lens

Unit-II

Emmetropia &Ammetropia—Detailed study –Aetiology, Clinical features, management, complications] of Myopia, Hypermetropia, Astigmatism, Aphakia/Pseudo-phakia, Anisometropia, Anisekonia, Amblyopia
Growth of eyeball in relation to refractive errors
Simple and Toric Transposition

Unit-III

Retinoscopy -Principle & Method, Objective Refraction, Subjective Refraction, Verification of subjective acceptance –cross cylinder, Duochrome test, Stenopaeic slit test, Astigmatic fan test, Pin Hole test, Difficulties faced during retinoscopy and their solution

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Practice of Retinoscopy
2. Use of slit to find axis of astigmatism
3. Visual acuity charts
4. Practical models of Emmetropia, Myopia, Hypermetropia, Astigmatism

Bachelor of Optometry, 1st year
Second Semester
Fundamentals of Computer Science

Total: 40 Hours

Unit-I: Introduction:
What are computers, Application areas, Characteristics & limitations, Evolution of computers, Classification& generations of computers, Data representation in computer memory (numbering system)

Unit-II: Computers Architecture /Organization:
Basicarchitecture, Functional Block diagram, Types of computers on the basis of purpose, Signal and Portability.

Unit-III:
Hardware:
CPU their generations and performance parameters, Input, output and storage devices. Primary (Main) Memories (RAM, ROM, Types of RAM and ROM, Cache Memory, Registers and types of registers, Storage Evaluation Criteria, Memory Capacity), Secondary Storage Devices: (Magnetic Disk, Floppy and Hard Disk, USBs, Optical Disks CD-ROMs)
Software:
Types: System Software (Machine Level Languages, Operating Systems, Device Specific Drivers), Higher Level Languages, and Applications
Languages: Machine Language, Assembly Languages, Programming Languages. Use of Compilers, Assemblers, Linkers, Loaders and interpreters in programming languages
Operating System: Booting/Start Up Procedure of machines, Introduction to Operating System, Functions and Classification of Operating Systems, Basic introduction to DOS, UNIX/LINUX OS, Windows
HTML, Use of Multimedia, Computer aided teaching and testing
Application Software MS office (Word, Excel and Powerpoint)

Unit-IV: Basic Introduction to Computer Networks:
Data Communication, Network devices (Hub, Switches, Modems, and Routers etc), LAN, LAN topologies, WAN, MAN, Internet: Introduction, Basics of E-mail, Web browsers (IE, Google Chrome, and Mozilla Firefox),

Structure of Universal Resource Locator, Domains (.com, .in, .country specific, .org and rationale behind them), IP address, Backbone network, Network connecting devices, HTTP, DNS, Network Security and Search Engine.

Bachelor of Optometry, 2nd Year
Third Semester
Ocular Diseases-1

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I:
Diseases of conjunctiva-Infective Conjunctivitis, Allergic conjunctivitis, Trachoma, Ophthalmia neonatorum, Pinguecula, Pterygium, Concretions, sub-conjunctival haemorrhage, Xerophthalmia

Unit-II: Diseases of Cornea-Corneal ulcers-bacterial, viral and fungal. Herpes zoster ophthalmicus, acanthamoeba keratitis, Arcus senelis, Band shaped keratopathy, Keratoconus, Corneal opacity, Degenerations and dystrophies of cornea

Unit-III: Diseases of Sclera-Scleritis, Episcleritis, Staphylomas,

Unit-IV: Diseases of Uveal Tissue-Iridocyclitis-clinical features and ,management, Abnormalities of iris-- Endophthalmitis, Sympathetic ophthalmia,

Unit-V: Diseases of Lens-Cataract-its types, causes, work-up of a patient of cataract, indications of surgery, types of surgeries, complications of surgery, different types of IOLs, sub-luxation and dis location of lens

Bachelor of Optometry, 2nd Year
Third Semester
Optometric Instruments-1

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I:
Simple and Compound Microscope
Lensometer
Genewa lens measure
Trial Frame design

Unit-II:
Types of retinoscopes
Projection Charts
Auto-refractometer

Unit-III:
Types of Ophthalmoscopes
Indirect Ophthalmoscope, Direct Ophthalmoscope
Dark adaptometer

Unit-IV:
Slit Lamp: Techniques of slit lamp examination, Slit lamp Photography
Tonometer-Schiotz and applanation, Non-Contact Tonometer
Placido disc, Keratometer

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1) Lensometer
2) Retinoscopes
3) Auto refractometer
4) Ophthalmoscopes
5) Tonometers
6) Keratometer

Bachelor of Optometry, 2nd Year
Third Semester
Visual Optics-2

60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I:
Accommodation and Convergence-Far point, Near point, Amplitude, Mechanism and theories of accommodation, Anomalies of accommodation-Paralysis of accommodation, Presbyopia, Spasm of accommodation, Types of convergence, AC/A ratio, Convergence insufficiency

Unit-II:
Schematic eye, Reduced eye
Strum's Conoid
Axes and angles of eyeball

Unit-III:
Ghost Images—Definition, Mechanism of formation and trreatment
Keratoconus
Post-Op. Refractive errors/ Residual refractive errors
Refraction of irregular reflex

Unit-IV:
Effective power of Spectacles-Vertex distance effects, Spectacle magnification and minification and its effect on accommodation and convergence.

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Measurement of corneal curvature
2. Measurement of corneal thickness
3. Effect of lens and prism in front of eyes
4. Study of Purkinje images

Bachelor of Optometry, 2nd Year
Third Semester
Public Health and Community Optometry

---60 Hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I:
Public Health Optometry-Concepts and implementation, Stages of diseases, Dimensions, determinants and indicators of health.
The Epidemiology of Blindness—Defining blindness and visual impairment.

Unit-II:
Survey Methodology
Screening procedures in Ophthalmology -School eye screening programs
Primary eye care

Unit-III:
Organization of Eye camps
Health Education, Nutritional blindness in relation to Vitamin A deficiency
Rehabilitation of the visually handicapped
National program for control of Blindness
Vision 2020 : The Right to sight

Unit-IV:
Ethical, legal, social and scientific issues in relation to optometry-Definition and scope of Medical ethics, Code of conduct, malpractice, Negligence, Valid consent, Professional confidentiality, Rights of patients, Professional indemnity insurance

Bachelor of Optometry, 2nd Year
Third Semester
Medical Psychology

Theory: 60 hours

Course Objectives: The course shall provide an overview of Human Behavior which gives a comprehensive information about all important areas of psychology. Any student even without any background of psychology can have detail understanding of the subject as such.

Course Outcome: It is a beginner's course to introduce the basic aspects of Psychology. The students shall be exposed to different types of behavior with an understanding of the unique nature of the subject. At the end the students shall have an understanding of various approaches to explain behavior. The Students shall feel better (being) acquiring some competence in knowing the self and other's behavior.

Unit	Contents	Teaching Hrs.	Domain
I	**Unit I: Introduction to Psychology** i. Nature of Psychology; Scope of Psychology ii. History of Psychology and Resent Trends iii. Methods of Psychology; Normality and Abnormality- Concept and Criterion *Applying Psychology in everyday life*	20 6 7 7	**Must know** *Nice to know*
II	**Unit II: Basic Psychological Processes** i. Introduction to Sensation, Attention and Perception ii. Introduction to Learning, Memory and Intelligence iii. Introduction to Counselling, Ophthalmic Counselling, Empathy and Therapeutic Relationship *Self-Concept and Self- esteem*	20 6 7 7	**Must know** *Nice to know*
III	**Unit III: Psychological Reactions** i. Adapting Changes in Vision; Body Image	20 6 7	**Must know**

	ii. Disability and Rehabilitation iii. Illness, Grief and Traumatic Experiences *Managing Disability*	7	*Nice to know*

Recommended Readings:

1., Nolen-Hoeksema, S., Fredrickson, B. L., Atkinson, R.C., Loftus, G. R., Hilgard, E.R.&; Lutz, C. (2014). Introduction to Psychology. Cengage Learning EME.

2. Baron, R.A. (2002). Psychology (5 th ed.). New Delhi: Pearson Education.

3. Meyer, G. E., & Ciccarelli, S. K. (2008). Psychology (Paperback). Pearson.

4. Morgan, C. T., King, R. A., Weisz, J. R., & Schopler, J. (2006). Introduction to Psychology, 7th eds. New Delhi: Tata McGraw-Hill

Bachelor of Optometry, 2nd Year
Third Semester
Environmental Science

Theory: 60 Hours

Unit 1:

The Multidisciplinary nature of environmental studies

- Definition, scope and importance.
- Need for public awareness.

Natural Resources

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 forests 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.

Unit 2:

Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological

pyramids. Biodiversity and its conservation

- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts
- Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Unit 3:

Environmental Pollution

Definition, causes, effects and control measures of:-

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
- Fireworks, their impacts and hazards
- Pollution case studies.
- Disaster management : floods, earthquake, cyclone and landslides.

Unit 4 :

Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Consumerism and waste products.
- Environmental Legislation (Acts and Laws)
- Issues involved in enforcement of environmental legislation

Human Population and the Environment

- Population growth, variation among nations with case studies
- Population explosion – Family Welfare Programmes and Family Planning Programmes
- Human Rights.
- Value Education.
- Women and Child Welfare.

Bachelor of Optometry, 2nd Year
Third Semester
Medical Emergencies & Patient Care

-60 Hours

Unit – I: Introduction to Emergency Services

Organization of Emergency Department, Guidelines in Emergency, Clinical Monitoring, Fluid Therapy and Blood Transfusion, Airway Management, Cardiopulmonary Resuscitation,
Principal of Mechanical Ventilation, Injection – An Infusion Method, Acid Base and Electrolyte Imbalance

Unit – II: Handling of Different Emergencies

Cardiogenic Shock, Congestive Cardiac Failure, Myocardial Infarction, Head Injuries, Vasovagal Syncope, Seizer, Epilepsy, Conjunctival and Corneal Foreign Body, Foreign Body in Nose & in Ear, Epistaxis, Asthma, COPD, Haemoptysis, Rib Fracture, Tear Gas Exposure,
Food Poisoning, Diarrhea, Urine Retention, Blunt Scrotal Trauma, Hypo & Hyperthermia

Unit – III: Fundamentals of Patient Care

Concept of health & Illness, Health Determinants, Concept of Patients & Their Types, Patient
Centred Care & Fundamentals of Communications, Reporting & Recording of Patients,
Rights of Patients , Concepts of Disease & Its Types, General Concept, Care & Prevention of
Accident, Trauma & Infections

Unit – IV: Patient Care, Associated Units & Departments

Ambulatory Units, Critical Care Units ,Paediatric, Neonatal Intensive Care Unit (NICU), Emergency Department, Inpatient Units, Haematology/Oncology and Immunology Unit , Orthopaedic Unit, Psychiatry Unit ,Neurology and Neurosurgical Unit, Renal, Dialysis Unit, Gastroenterology/Endocrinology Unit, Life Flight Critical Care Transport Program, Radiology Department, Surgical Units, Cardiac Catheterization Lab, Operating Room, Post Anaesthesia Care Unit, Managing patients with disabilities, Geriatric Care, Care of Critically Ill Patients, Tracheotomise Patients. Nutritional Support in IC

Bachelor of Optometry, 2nd Year
Fourth Semester
Ocular Diseases-2

---60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Glaucoma-Definition, congenital glaucoma, POAG, PNAG-clinical features and management. Anti-glaucoma drugs and types of glaucoma surgeries, secondary glaucomas

Unit-II

Diseases of Vitreous, Retina and Optic nerve- Basic idea about Asteroid hyalosis, Synchysisscintillans, Vitreous haemorrhage, retinal detachment, retinopathy of prematurity and optic neuritis, Papilloedema, Optic Atrophy, Endophthalmitis

Unit-III

Ocular manifestations of systemic diseases—Diabetes, Hypertension, Xerophthalmia, Tuberculosis
Diseases of eyelids-Stye, Chalazion, Ptosis, Entropion, Ectropion
Diseases of Lacrimal apparatus-congenital dacryocystitis, Chronic dacryocystitis
Diseases of Orbit-orbital cellulitis, proptosis, Pthisis bulbi

Unit-IV

Ocular injuries-Mechanical, Penetrating, thermal, chemical injuries and their management

Bachelor of Optometry, 2nd Year
Fourth Semester
Optometric Instruments-2

-60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Pupillometer
Glare acuity tests
Exophthalmometer

Unit-II

Perimeter – Manual & automated
OCT, A and B Scan

Unit-III

Pachymeters
Contrast sensitivity tests
Colour vision tests

Unit-IV

Nerve fiber analyzer
Specular Microscopy, Aesthesiometer
Fundus Camera

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1) Specular Microscopy
2) Exophthalmometer
3) Perimeter
4) Fundus Camera
5) Contrast sensitivity tests
6) Glare acuity tests
7) Colour vision tests
8) Dark adaptometer
9) OCT, A and B Scan

Bachelor of Optometry, 2nd Year
Fourth Semester
Binocular Vision and Orthoptics -1

--60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Review on Ocular muscles- Types, origin , Action , innervations, Microscopic structure
Ocular movement- Duction, versions, Vergence
Laws of ocular movement
Fick's Law, Position of gaze

Unit-II

Yokes muscles, antagonist, synergist, agonist
Ocular movement – saccadic ,pursuits, optokinetics
Binocular single vision- Grades of BSV, Development of BSV ,advantages of BSV
Test for grades of BSV

Unit-III

Horopter- Concepts , types , method of measurement
Visual space and physical space
Visual direction
Diplopia/ confusion
Retinal disparity, pannum's area

Unit-IV

Retinal correspondence
Suppression
Stereopsis – Binocular and monocular clues
Amblyopia –Definition, Concepts, Classification of Amblyopia, Clinical features of amblyopia, Investigation of amblyopia, Amblyopic therapy
Nystagmus-Definition, Etiology, Types of nystagmus, Clinical examination of nystagmus, Treatment of nystagmus

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1) Pleoptics
2) Orthoptic Exercises
3) Synptophore
4) Near point of accommodation
5) Near point of convergence

6) Fusion exercise
7) Stereopsis exercise

Bachelor of Optometry, 2nd Year
Fourth Semester
Investigations in Clinical Ophthalmology-1

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Lensometry
Keratometry
Contrast Sensitivity

Unit-II

Slit Lamp
Gonioscopy
Tonometry-Schiotz, Applanation, NCT

Unit-III

Pachymetry
Perimetry
Ultrasono-graphy-A Scan biometry and B Scan
Colour Vision Investigations – Ishihara Charts, Lantern test, Negal'sanomaloscope, 100 Hue Color vision test
Syringing & Lacrimal function Test

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Focimeter
2. Keratometry
3. Perimetry
4. Syringing & Lacrimal function Test
5. Slit Lamp
6. Applanation, schiotz tonometry, NCT
7. Contrast Sensitivity

Bachelor of Optometry, 2nd Year
Fourth Semester
Contact lens-1

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Review on anatomy and physiology of cornea
Corneal physiology and contact lens

Unit-II

Slit- lamp technique for contact lens evaluation
Keratometry, Placido's disc
Topography
Uses of specular microscopy in contact lens
Uses of pachymetry in contact lens

Unit-III

History of contact lens
Contact lens materials- classification ,concept , advantages and disadvantages
Important of contact lens material properties
FDA classification

Unit-IV

Optics & principle of contact lens
Glossary terms: Contact lenses
Indications & Contraindications of contact lens
Contact lens manufacturing process
Identifications of contact lens types

Unit-V

Soft and RGP Contact lens Design
Contact lens Verification & Modification
Preliminary measurement and investigation for Contact lens
Insertion and removal of contact lens

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Slit –lamp examination
2. Keratometry – BC calculation
3. Preliminary examination of contact lens

Bachelor of Optometry, 3rd Year
Fifth Semester
Investigations in Clinical Ophthalmology-2

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Specular Microscopy
Ocular Photography -anterior segment

Unit-II

Fundus Photography
Fluorescein Angiography
Dark Adaptometry : Adaptation &Adaptometry

Unit-III

Nerve fiber analyzer
UBM
OCT

Unit-IV

ERG, EOG, VEP
Laser therapy in optometry

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Fluorescein Angiography
2. Specular Microscopy
3. Dark Adaptometry
4. A -Scan Biometry
5. B Scan
6. ERG/EOG/VER
7. OCT

Bachelor of Optometry, 3rd Year
Fifth Semester
Contact Lens-2

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Introduction to Contact lens fitting
Fitting of Spherical SCL and effect of parameter changes
Fitting of Toric SCL and effect of parameter changes
Fitting spherical RGP contact lens. Low OK, high Ok
Effect of RGP CL parameter changes on lens fitting
Fitting Toric RGP Contact lens in Astigmatism

Unit-II

Fitting in keratoconus, Fitting in Aphakia, Fitting in pseudophakia
Fitting contact lens in children
Bifocal contact lens- Fitting in Bifocal contact lens

Unit-III

Lens dispensing and patients education
Conducting after care visit
Follow-up fitting & Slit-Lamp Examination
Checking finished lenses parameter
Contact lens complication

Unit-IV

Continuous wear & extended wear lenses
Therapeutic Contact lens
Fitting procedure for therapeutic contact lens
Bandage contact lens
Contact lenses for ocular surgeries
Disposable contact lens and Cosmetic contact lens

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Slit Lamp examination
2. Keratometry
3. Soft Contact Lens fitting
4. RGP lens fitting
5. Counselling of Contact Lens patient

Bachelor of Optometry, 3rd Year
Fifth Semester
Dispensing Optics

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Types of ophthalmic lenses--Plastic Lenses, Glass lenses, Polycarbonate lenses - Manufacturing & Characteristic
Spectacle Lens Manufacturing -Spherical, Toric, Bifocals, Lenticular
Best Form lenses, Pantoscopic tilt, Retroscopic tilt and its consequence, Tilting of lens

Unit-II

Spectacle Frames -History, Nomenclature, Types & parts, sides, joints, frame bridge.
Shape of Spectacles-- Frame & Face Measurements

Unit-III

Lens Designs –Ashperic. Lenticular, Achromatic
Progressive addition lenses
High Index Lenses,
Photochromatic Lenses
Tinted Lenses, ARC lenses, Hard coat lenses, U V protective lenses, Balance lens
Optical centre of a lens
Polaroid Lenses
Bifocals/Toric lenses/ Cross compound lenses

Unit-IV

Measurement for ordering spectacle, IPD, Marking centration.V. D. Calculation.
Fitting Bifocals, Multifocals, Prism Lenses
Fitting Lenses in Frames
Glazing & Edging
Final Checking & Adjustments to prescriptions

Unit-V

Patient complains and management
Repair of spectacles
Test chart standards
Phoropter
Projection Charts
Refraction room Standards

Practical

L	T	P	Credits	Examination: 30 Marks
-	-	4	2	Int. Assessment:20 Marks
				Total: 50 Marks

1. Workshop
2. Manufacturing Spectacle Lens
3. Manufacturing Bifocal Lenses
4. Measurement for ordering spectacle, IPD, Marking centration,.
5. Fitting Bifocals, Multifocals, Prism Lenses
6. Fitting Lenses in Frames
7. Glazing & Edging
8. Final Checking, Adjustments to prescriptions
9. Patient complains, handling correction.
10. Repair of spectacles
11. Special types of spectacles ptosis, hemianopic glasses

Bachelor of Optometry, 3rd Year
Fifth Semester
Binocular Vision and Orthoptics-2

60 Hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Accommodation- Definition& theory of accommodation, Range & Amplitude of accommodation, Insufficiency & paralysis of accommodation, Spasm of accommodation, exercise and vision therapy of accommodation

Unit-II

Convergence- Definition, Range and Types, Convergence insufficiency, exercise and vision therapy of convergence

Unit-III

Strabismus – Definition, Classification

Evaluation of Strabismus- Prism bar cover test(PBCT), Corneal reflex test- Hirschberg & PBRT, Maddox rod Test & Maddox wing test, Diplopia Charting ,WFDT, Bagolini Strighted Glass test, Hess Screen Test

Latent Squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Manifest Squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Unit-IV

Divergent Squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Convergent Squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Paralytics Squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Vertical & restrictive squint- Concepts, classification ,clinical features, evaluation ,exercise ,vision therapy and management options

Head posture & its significance

Synoptophore

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1. Evaluation of squints
2. Synoptophore
3. Work-up of squints

Bachelor of Optometry, 3rd Year
Fifth Semester
Research Methodology & Biostatistics

Total: 60 Hours

Unit-I: Introduction

Meaning, definition, characteristics of statistics
Importance of the study of statistics
Branches of statistics
Statistics and health science including nursing
Parameters and estimates
Descriptive and inferential statistics
Variables and their types
Measurement scales

Unit-II: Tabulation of Data

Raw data, the array, frequency distribution
Basic principles of graphical representation
Types of diagrams - histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve

Unit-III: Measure of Central Tendency

Introduction: Uses, applications and practical approach
Definition and calculation of mean - ungrouped and grouped data
Meaning, interpretation and calculation of median ungrouped and grouped data
Meaning and calculation of mode
Comparison of the mean, and mode
Guidelines for the use of various measures of central tendency

Unit-IV: Measure of Variability

Introduction: Uses, applications and practical approach
The range, the average deviation or mean deviation
The variance and standard deviation
Calculation of variance and standard deviation for ungrouped and grouped data
Properties and uses of variance and Standard deviation

Unit-V: Sampling Techniques

Introduction: Uses, applications and practical approach
Criteria for good samples
Application of sampling in Community
Sampling methods, sampling and non-sampling errors
Sampling variation and tests of significance

Bachelor of Optometry, 3rd Year
Fifth Semester
Hospital Management & Medical ethics

L	T	P	Credits		
3	1	-	4	**Examination:**	**60 Marks**
				Int. Assessment:	**40 Marks**
				Total:	**100 Marks**
				Duration of Examination: 3 Hours	

UNIT-1 Introduction to hospital staffing- Hospital staffing, administration, PACS, HIS, RIS, DICOM. Medical records and documentation.

UNIT-2 Legal & medical issues- Legal and Ethical issues towards patient rights, patient responsibility, legal concerns, History taking, patient monitoring, inform consent, mal-practice, patient privacy issues. Professional ethics and Code of conduct of radiographer. Medical legal issues (MLC).

UNIT-3 Handling of patients Seriously ill and traumatized patients, visually impaired, hearing and speech impaired patients, mentally impaired patients/ psychologically issues, infectious patients, critical/trauma patients, pregnant patient, patient with implant. Handling of patient with life threading diseases like HIV, STD, HBsAG, etc.

UNIT-4 Departmental Safety & Infection Control Safety and hazards from material and electricity etc. Biomedical waste management and control. **Infection control** Skin care, donning of gowns, gloves, face masks, head caps, shoe covers. **Vitals signs-** Vital signs. How to measure vital signs. **Body mechanics and transferring & shifting of patient** Draw sheet lift, use of slide boards, wheelchair to couch, couch to wheelchair, couch to table, three men lift and four men lift Orthodox & Austrian method etc. **First aid-** Artificial respiration, hemostasis, first aid techniques, ABCD management.

UNIT-5 Anesthesia- Local anesthesia and general anesthesia, uses in hospital, Facilities regarding general Anesthesia in different department of hospital. Management of adverse.

Bachelor of Optometry, 3rd Year
Sixth Semester
Low Vision Aids

60 Hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Identifying the low vision patient
Basic idea about diseases responsible for low vision

Unit-II

Refraction, special charts, Radical retinoscopy
Evaluating near vision: Amsler grid and field defects, prismatic scanning

Unit-III

Optics of low vision aids
Demonstrating aids – Optical-Magnifiers, Telescopes, Field expanders Non-optical, Electronic

Unit-IV

Guidelines for determining magnification and selecting low vision aids for distance, intermediate and near
Children with low vision
Rehabilitation of the Visually handicapped

Practical

L	T	P	Credits
-	-	4	2

Examination: 30 Marks
Int. Assessment:20 Marks
Total: 50 Marks

1 Refraction in Children
2 Refraction in adults
3 Refraction in patients of low vision
4 Demonstration of different types of low vision aids available in market
5 Work-up of a patient of low vision

Bachelor of Optometry, 3rd Year
Sixth Semester
Eye Banking and Management of OT

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

EYE BANKING

Unit-I

Publicity
How to donate your eyes
Collection of eyes
Preservation of eyes

Unit-II

Pre-operative Instructions
Post-operative Instructions
Latest techniques for preservation of donor Cornea
Human organ transplantation act 1994-Brief Idea

MANAGEMENT OF O T

Unit-III

Introduction to Operation Theater in general-- How to achieve asepsis, scrubbing techniques, theater clothes, handling sterilized articles in OT, OT environment
Drugs used in OT in relation to ophthalmology-Mydriatic and miotic agents, Local anesthetic agents [Lignocain, Bupivacain, Proparacain], Viscoelastic agents, Trypan blue dye etc.
Sterilization procedures of operation theater and Instruments

Unit-IV

Maintenance of Instruments and equipments: Ophthalmic Instruments, Orthoptics Instruments, Surgical Instruments, Optometric & Contact Lens Equipment
Instruments required for different types of ophthalmic surgeries—Cataract, Glaucoma, Squint, DCR, DCT, Entropion, Probing, Keratoplasty, Ptosis.
Biomedical waste management-Generation, Segregation, transportation, disposal of biomedical waste. Regulating authority. Risks involved to public and waste handlers.

Bachelor of Optometry, 3rd Year
Sixth Semester
Occupational Optometry

60 Hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

Unit-I

Introduction to occupational health, hygiene and safety
International bodies like WHO, ILO etc.
Electromagnetic radiations and its effects on eye

Unit-II

Factory act, ESI act
Occupational Hazards and preventive/ protective methods

Unit-III

Industrial vision screening
Vision Standards Railways, Roadways, Airlines

Bachelor of Optometry, 3rd Year
Sixth Semester
Pediatric & Geriatric Optometry

—60 hours

L	T	P	Credits
3	1	-	4

Examination: 60 Marks
Int. Assessment:40 Marks
Total: 100 Marks
Duration of Examination: 3 hours

PAEDIATRIC OPTOMETRY

Unit-I

Genetic factors – Perinatal factors- Prenatal factors – Postnatal factors responsible for diseases in children

Unit-II

Assessment of visual acuity in children
Measurement of refractive status
Determining binocular status
Management of Myopia, Pseudo myopias Hyperopia Astigmatism, Anisometropia, Amblyopia, strabismus and nystagmus, Vergence and accommodation

GERIATRIC OPTOMETRY

Unit-I

Structural and physiological changes in eye with age
Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders, vascular diseases of the eye

Unit-II

Special considerations in ophthalmic dispensing to the elderly
How to carry on one's visual task overcoming the problems of aging?