PONDICHERRY UNIVERSITY

Puducherry

Regulations and Syllabus

Bachelor of Science in OPTOMETRY
(B.Sc. OPTM)

2024-2025

Index

PONDICHERRY UNIVERSITY
Puducherry
REGULATIONS OF THE UNIVERSITY

I. SHORT TITLE AND COMMENCEMENT

These regulations shall be called **"THE REGULATIONS FOR THE BACHELOR IN OPTOMETRY OF PONDICHERRY UNIVERSITY,** Puducherry".

They shall come in to force from the academic year 2024-25 Session.

The regulation and syllabi are subject to modifications by the standing Under Graduate Board of Studies for Bachelor in Optometry courses from time to time.

II. COURSEPHILOSOPHY

Optometry is recognized by the World Health Organization (WHO) as an independent profession through its ongoing official relations with the World Council of Optometry (WCO) – the international optometric organization which represents almost 300,000 optometrists from 87 member organizations in 47 countries.

Optometry as a profession has the primary public health responsibility for eliminating uncorrected refractive error. To provide excellent vision care to all the people of the country, India needs 116,000 optometrists. India currently has approximately 9,0004-year trained optometrists and an estimated 30,0002-year trained eye care personnel.

Aim and Objectives

Aim:

The aim of the undergraduate Optometry Program is to play a vital role in healthcare, that is autonomous and concerned especially with examining the eye for defects and faults of refraction, with prescribing correction 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.

Objectives:

On completion of Bachelor of Optometry Program the graduates will be able to:

- Be able to develop skills to carry out Ophthalmic Investigations.
- Be able to do refraction work including prescription of glasses,contact lenses, low vision aids.
- Be able to assess disorder rof Ocular motility and uniocular and binocular visual functions and knowledge of principles of non-surgical therapy and indications of surgery.
- To impart knowledge with regard to common eye diseases.
- To impart training to develop skill in manufacturing of spectacle lenses and contact lenses. To impart knowledge regarding organizations of eye banks and preservation of ocular tissues. To impart knowledge regarding importance and the methodology of conducting surveys for early detection of visual defects, prevalence of ocular diseases and organization of community services like eye camps, schools, clinics and community eye care programme.
- To impart knowledge regarding the programme of blindness, its causes and principles of rehabilitation of the blind.

III PROGRAM OUTCOME:

Upon the completion of the course:

- The graduates will be knowledgeable in ophthalmic and systemic care to practice as an optometrist.
- The graduates will interpret results of common ophthalmic procedures, develop differential and definitive diagnoses, including the skillful use of vision care instruments and material.
- The graduates will provide quality eye and vision care through comprehensive and appropriate examination, measurement, assessment, diagnosis, treatment and management of eye and vision conditions.
- The graduates will be cognizant and responsive to the health care needs of the community and possess a commitment to continuously improve knowledge and abilities
- The graduates will possess the initiative and critical acumen required to continuously improve their knowledge through self-study, continuing education programme or higher studies.

III. REGULATIONS:

1. ELIGIBILITY FOR ADMISSION:

The admission for B.Sc in optometry is based on the CENTAC process. The reservation and other process are as per the Government norms. Candidates should have completed a minimum of 17 years of age as on 31st December of the year of admission. The upper age limit is 25 years. (Relaxation up to 5 years for SC/ST candidate and up to 3 years for MBC/OBC candidates.)

Candidates should have a pass in the Higher Secondary Examination conducted by the Board of Higher Secondary Examination of Tamil Nadu, or any other equivalent examination accepted by the University, thereto with a minimum of 50% marks (40% marks for SC, ST, MBC and OBC candidates) in aggregate of Science subjects (Physics, Chemistry, Biology/Botany & Zoology) and should have English as one of the subjects.

Candidate shall be medically fit to undergo the Optometry program.

For Lateral entry: Diploma in Optometry courses approved by the Government after completing 12th Class / 10 +2 of CBSE or equivalent with minimum aggregate of 50% marks (40% marks for SC, ST, MBC and OBC candidates) in Physics, Chemistry and Biology provided the candidate has passed in each subject separately. The age limit is 35 years. The Government service candidates will be exempted, if approved by the committee or the Government.

Provision for lateral entry: lateral entry to second year for B.Sc Optometry program for candidates who have passed Diploma program in Optometry from the Government Boards and recognized by State / Central University, full filling the conditions specified and these students are eligible to take admission on lateral entry system only if the same subject have been studies at 10+2 scheme and diploma level. The admission process is as per the Government rule and regulations from time to time. Students to be admitted under lateral entry shall be 10% over and above the sanctioned intake.

The lateral entry candidates have the direct entry into the second year (i.e from III semester) are exempted from the first year (Semester – I and Semester – II) curriculum. For the grant of the University degree the lateral entry candidates have to complete the semester – III to Semester – VI, and the internship compulsory and mandatory.

2. DURATION OF THE COURSE AND COURSE OF STUDY:

The duration of the program shall be **Three years / Lateral entry two years** of full-time study and **One year of compulsory rotatory internship**.

3. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examinations of the Course.

4. PROGRAM DETAIL:

The program structure is shown in Table I.
The detailed syllabus in respect of the program is appended to this regulation.

5. ATTENDANCE:

Examination will be conducted in both theory and practical, as prescribed.

Candidate will be permitted to appear for the University Examination in the subject only if they secure not less than 80% attendance (irrespective of the kind of absence) in each subject of that semester.

Condonation of shortage of attendance in aggregate upto 10% in each semester may be granted by the College Academic Committee and as per regulations of University. For Students internship offered during VII and VIII semesters, 100% attendance is compulsory. However, the students may be condoned upto 15%, under extraordinary situation, by the Dean/Principal based on the genuineness of the case upon the recommendation of the concern program teaching and Head of the Department.

The students failing to attend classes/examinations on non-official ground will be treated as absent. Student deputed for Sports, Cultural Meets, etc with prior permission of Dean/Principal of the College shall be given attendance for the period of absent.

6. INTERNAL ASSESSMENT:

Internal assessment will be done in each subject of study and the marks will be awarded to the candidates as detailed in the scheme of examinations.

The marks awarded will be on the basis of the candidate's performance in assessment, class tests, clinical/laboratory work, preparation and seminar presentation assessed by the concerned faculty.

The marks secured by the candidate during each semester in each subject shall be forwarded to the University at the end of the semester, i.e., before the commencement of the written examination.

7. EXAMINATIONS:

The University Examinations will be conducted in semester pattern for all the three years, each year consisting of two semesters.
The particulars of subjects for various examinations and distribution of marks are shown separately.
The examination for the main subjects will be conducted by the University and for the non-examination subjects by the college.
The maximum number of candidates for practical examination should not exceed 20 per day.
One internal and one external examiner should jointly conduct practical examination for each student.
An examiner should not be below the rank of an Assistant Professor or Tutor/Demonstrator.

8. PASSING MINIMUM

Candidate has to pass separately in theory + Viva voce and Practical by getting a minimum of 50% marks in combined internal assessment and University examination. A candidate should secure 50% of the marks in theory and 50% in practical (wherever prescribed)
If a candidate fails in either theory or practical, he/she has to re-appear for both theory and practical.
A candidate should secure 50% of total marks in the test conducted by the college for the non-examination subject.

9. PROCEDURE FOR PASSING THE PROGRAME

The maximum period to complete the program successfully **should not exceed a period of eight years.**

10. INTERNSHIP

There shall be a compulsory full-time rotatory internship after the candidate having passed all the subjects prescribed in the scheme of examination.
The internship should be done for a period of one year, in an Institution/ Hospital approved.
No candidate shall be eligible for the award of the degree without successfully completing one-year internship.

Desirable: A Research study to be done and submit the report before the one year of Internship. One or more value added courses (like Swayam) during final year or Internship.

11. ELIGIBILITY FOR AWARD OF DEGREE:

The candidates shall be eligible for the ***Degree of Bachelor of Optometry and / lateral entry*** when they have undergone the prescribed program of study for a ***period of three years / two years (for lateral entry)*** in an institution approved by the University and have ***passed the prescribed examinations in all subjects*** and ***have completed a compulsory internship over a period of one year*** in an approved institution.

12. DECLERATION OF CLASS:

A successful candidate obtaining **75% and more marks** in the grand total aggregate in the **First attempt** shall be declared to have passed these subjects with **Distinction**.

A successful candidate obtaining **60% and more but less than 74.9% marks** in the grand total aggregate in the **First attempt** shall be declared to have passed with **First Class**.

A successful candidate obtaining **50% and more but less than 59.9% marks** in the grand total aggregate in the **First attempt** and the candidate who passed with more than one attempt irrespective of the percentage of marks secured shall be declared to have passed these subjects with **Second Class.**

Ranks shall be declared on the basis of the aggregate marks obtained by a candidate in the University examination subjects of the program.

Only those candidates **who have passed all the subjects in all examinations in the First attempt shall be eligible for the Award of rank.**

Program Structure–OPTOMETRY

TABLE - 1

Year	Sem	Code	Subject Title	Hours			
				Theory	Practical	Clinical	Total
I Year	I Sem	BOPT–001	General Anatomy	60	30	-	90
		BOPT –002	General Physiology	60	30	-	90
		BOPT –003	General Biochemistry	60	30		90
		BOPT –004	Physical Optics	60	30	-	90
		BOPT –C01	Communication and Soft skill	30			30
			Clinical Hours			110	110
			Total Hours	**270**	**120**	**110**	**500**
	II Sem	BOPT–005	Ocular Anatomy	60	30	-	90
		BOPT–006	Ocular Physiology	60	30	-	90
		BOPT–007	Ocular Biochemistry	60	30	-	90
		BOPT–008	Ocular Pathology & Microbiology	60	30		90
		BOPT-009	Geometrical Optics	60	30		90
		BOPT–C02	Computer Application	30	30	-	60
			Clinical Hours			90	90
			Total	**330**	**180**	**90**	**600**
		I Year Over all Total		**600**	**300**	**200**	**1100**
II Year	III Sem						
		BOPT-010	Visual Optics-I	60	-	30	90
		BOPT-011	Optometric Optics-I	60	-	30	90
		BOPT-012	Optometric Instrumentation	60	30	-	90
		BOPT-013	Ocular Diseases-I	60	-	30	90
		BOPT-014	Clinical Examination of Visual System	60	-	30	90
		BOPT-015	Clinical Optometry Practical - I	-	-	120	120
		BOPT–C03	Medical Psychology	30	-	-	30
			Total Hours	**330**	**30**	**240**	**600**
	IV Sem	BOPT –016	Visual Optics-II	60	-	30	90
		BOPT –017	Optometric Optics-II	60	-	30	90
		BOPT –018	Ocular Diseases-II	60	-	30	90
		BOPT- 019	General & Ocular Pharmacology	60	30	-	90
		BOPT- 020	Clinical Optometry Practical - II	-	-	210	
		BOPT- C04	Environmental Sciences	30	-	-	30
			Total Hours	**270**	**30**	**300**	**600**
		II Year Over all Total		**600**	**60**	**540**	**1200**
III Year	V Sem	BOPT –021	Contact Lens-I	60	-	30	90
		BOPT –022	Pediatric Optometry &Geriatric Optometry	60	-	30	90
		BOPT –023	Binocular Vision-I	60	-	30	90
		BOPT –024	Low Vision Aids	60	-	30	90
		BOPT –025	Systemic Diseases	60		30	90
		BOPT –026	Clinical Optometry Practical-III	-	-	120	120
		BOPT –C05	Biostatistics & Research Methodology	30	-	-	30
			Total	**330**	**0**	**270**	**600**
		BOPT –027	ContactLensII	60	-	30	90
		BOPT –028	Binocular Vision-II	60	-	30	90

	VI Sem	BOPT –029	Public Health & Community Optometry	60	-	30	90
		BOPT –030	Occupational Optometry	60	-	30	90
		BOPT –031	Clinical Optometry Practical-IV	-	-	210	210
		BOPT –C06	Medical Law, Ethics & Practice Management	30	-	-	30
			Total	**270**	**0**	**330**	**600**
			III Year Over all Total	**600**	**0**	**600**	**1200**
VI Year	**Internship**						**1 Year**

Note: BOPT C01 to BOPT C06 - Subsidiary Subjects

INTERNSHIP PROGRAM (1 YEAR)

VI Scheme of Examination with mark details

TABLE - II

Sem	Code	Subject	University marks		Internal Marks		Viva		Total		Total Theory+Practical	
		Theory & Practical	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
I Sem	BOPT –001	General Anatomy -Theory	80	32	25	-	20	10	125	63	200	100
		General Anatomy -**Practical**	50	25	25	-			75	37		
	BOPT –002	General Physiology - Theory	80	32	25	-	20	10	125	63	200	100
		General Physiology - **Practical**	50	25	25	-			75	37		
	BOPT –003	Biochemistry-Theory	75	30	25	-			100	50	100	50
	BOPT –004	Physical Optics	80	32	25	-	20	10	125	63	200	100
		Physical Optics-**Practical**	50	25	25	-			75	37		
	BOPT –C01	Communication and Soft skills	-	-	50	25	-	-	50	25	50	25
II Sem	BOPT –005	Ocular Anatomy	75	30	25	-			100	50	100	50
	BOPT –006	Ocular Physiology	75	30	25	-			100	50	100	50
	BOPT –007	Ocular Biochemistry	75	30	25	-			100	50	100	50
	BOPT –008	Ocular Pathology & Microbiology	75	30	25	-			100	50	100	50
	BOPT –009	Geometrical Optics	80	32	25	-	20	10	125	63	200	100
		Geometrical Optics-**Practical**	50	25	25	-			75	37		
	BAECT–C02	Computer application	-	-	50	25	-	-	50	25	50	25
III sem	BOPT –010	Visual Optics-I	75	30	25	-			100	50	100	50
	BOPT –011	Optometric Optics-I	75	30	25	-			100	50	100	50
	BOPT –012	Optometric Instrumentation	75	30	25	-			100	50	100	50
	BOPT –013	Ocular Diseases-I	75	30	25	-			100	50	100	50
	BOPT –014	Clinical Examination of Visual System	75	30	25	-			100	50	100	50
	BOPT –015	Clinical Optometry **Practical - I**	50	25	25		25	13	100	50	100	50
	BOPT –C03	Medical Psychology	-	-	50	25	-	-	50	25	50	25
IV sem	BOPT –016	Visual Optics-II	75	30	25	-			100	50	100	50
	BOPT –017	Optometric Optics-II	75	30	25	-			100	50	100	50
	BOPT –018	Ocular Diseases -II	75	30	25	-			100	50	100	50
	BOPT- 019	General &Ocular Pharmacology	75	30	25	-			100	50	100	50
	BOPT- 020	Clinical Optometry **Practical - II**	50	25	25		25	13	100	50	100	50

	BOPT- C04	Environmental Sciences	-	-	50	25	-	-	50	25	50	25
V sem	BOPT –021	Contact Lens-I	75	30	25	-			100	50	100	50
	BOPT –022	Pediatric Optometry &Geriatric Optometry	75	30	25	-			100	50	100	50
	BOPT –023	Binocular Vision-I	75	30	25	-			100	50	100	50
	BOPT –024	Low Vision Aids	75	30	25	-			100	50	100	50
	BOPT –025	Systemic Diseases	75	30	25	-			100	50	100	50
	BOPT –026	Clinical Optometry **Practical-III**	50	25	25		25	13	100	50	100	50
	BOPT –C05	Biostatistics & Research Methodology	-	-	50	25	-	-	50	25	50	25
VI sem	BOPT –027	Contact Lens-II	75	30	25	-			100	50	100	50
	BOPT –028	Binocular Vision-II	75	30	25	-			100	50	100	50
	BOPT –029	Public Health & Community Optometry	75	30	25	-			100	50	100	50
	BOPT –030	Occupational Optometry	75	30	25	-			100	50	100	50
	BOPT –031	Clinical Optometry **Practical-IV**	50	25	25		25	13	100	50	100	50
	BOPT –C06	Medical Law, Ethics & Practice Management	-	-	50	25	-	-	50	25	50	25

COURSE DESCRIPTION

1. GENERAL ANATOMY
Course Code: BOPT-001

Placement: I[st] Year (I[st] Semester) **Time:** Theory: 60 Hours
Practical:30 Hours

Course Description: The course is designed to assists students to acquire comprehensive knowledge of the normal structure of human body, to facilitate understanding of anatomical basic health, identify alteration in structure with emphasis on clinical application to practice.

UNIT- I (15 Hrs)
Introduction to Anatomy and Organization of the Human Body

- Introduction to Anatomical terms relative to position - anterior, ventral, posterior dorsal, superior, inferior, median, lateral, proximal distal superficial, deep, prone, supine, palmar and planter
- Anatomical planes (axial/ transverse /horizontal, sagittal /vertical plane and coronal/ frontal/ oblique plain)
- Movement (flexion, extension, abduction, adduction, medial, rotation lateral rotation, inversion, eversion, supination, pronation, plantar flexion, dorsi flexion and circumduction)
- Cell structure, cell division
- Tissues – Definition, types, characteristic, classification, location
- Membranes and glands -classification and structures
- Identify major surface and body landmarks in each body region organization of human body
- Hyaline, fibro cartilages elastic cartilages
- Features of skeletal, smooth and Cardiac muscles

UNIT-II (5Hrs)
The Respiratory System
- Structures of organ of Respiration
- Muscles of Respiratory System

UNIT-III (5Hrs)
The Digestive System
- Structures of alimentary canal and organs of digestion

UNIT-IV (5 Hrs)
The Circulatory and Lymphatic system
- Structures of blood components, anterior and venous system
- Position of heart related to Associated structures
- Chambers of heart, layers of heart
- Nerve supply to and blood supply to heart
- Veins used for IV injections
- Lymphatic tissues

UNIT-V (3 Hrs)
The Endocrine System
- Structures of hypothalamus, Pineal gland, Pituitary gland, Thyroid Parathyroid, Thymus, Pancreas and Adrenal gland.

UNIT-VI (3 Hrs)

The Sensory organ

- Structures of skin, eyes, ears, nose and tongue.

UNIT – VII (10 Hrs)

The Musculo Skeletal System

Muscular Systems

- Types and structures of muscles
- Muscle groups - Muscles of head, neck, thorax, abdominal, pelvis upper and lower Limb
- Principles of Muscles – deltoid, biceps, triceps, respiratory, abdominal, pelvic floor muscles gluteal muscle and vastus laterals
- Major muscles involved in procedure

Skeletal System

- Anatomical position
- Bones - type, structures, growth and ossification
- Axial and appendicular skeleton
- Joints – Classification, major joints and structures

UNIT-VIII (5 Hrs)

The Nervous Systems

- Review and structures of neurons
- Central Nervous system, Autonomic Nervous system, and Peripheral Nervous system
- Structures of brain, spinal cord, cranial nerve, spinal nerves, functional areas of cerebral cortex
- Ventricles of the brain- formation, circulation and drainage

UNIT-IX (4Hrs)

The Renal System

- Structures of Kidney, Ureters, bladder, urethra

UNIT-X (5Hrs)

The Reproductive System

- Structures of Male Reproductive Organs
- Structures of Female Reproductive Organs
- Structures of Breast

PRACTICAL'S:

- Histology of Types of Epithelium
- Histology of Serous, Mucous and Mixed Salivary gland
- Histology of the types of Cartilage
- Demo of all bones showing parts, radiographs of normal bones & Joints
- Histology of Skeletal (TS& LS), Smooth and Cardiac muscle
- Demonstration of Heart and Vessels of the body
- Histology of Large artery, Medium sized artery and vein, Large Vein
- Microscopic appearance of Large and Medium sized Artery and Vein, Large Vein
- Demonstration of all muscles of the body
- Pericardium
- Histology of Lymph node, Spleen, Tonsil and Thymus
- Demonstration of parts of Respiratory system
- Normal Chest radiograph showing Heart shadows

- Histology of Lung and Trachea
- Normal Angiograms
- Histology of Lymphatic tissues
- Radiographs of Abdomen – IVP, Retrograde cystogram
- Demonstration of parts of the Urinary system and Histology of Kidney, Ureter and Urinary bladder
- Demonstration of Male and Female Pelvis with organs in situ.
- Histology of Male and Female Reproductive organs
- Histology of Pituitary, Thyroid, parathyriod and Suprarenal glands
- Histology of peripheral nerve and optic nerve.
- Demo of all parts of brain.

Reference Books:

1. Inderbir Singh, Textbook of Anatomy, Jaypee, 7th Edi, Vol I to III, 2019
2. Chaurasia, Human Anatomy, CBS Publisher, 5th Edi, Vol 1 to 3, 2010.
3. Ross and Wilson Anatomy and Physiology in Health and illness, Elsever, 13th Edi, 2018.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Identification of Gross Spotters	30 marks
Identification of Histological slides	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

2. GENERAL PHYSIOLOGY
Course Code: BOPT-002

Placement: I[st] Year (I[st] Semester) **Time:** Theory: 60 Hours
Practical: 30Hours(Lab)

Course Description: The course is designed to assist students to acquire comprehensive knowledge of the normal functions of the organ systems of the human body to facilitate understanding of physiological basis of health, identify alteration in functions and provide the student with necessary physiological knowledge to practice.

COURSE OUTLINE

UNIT - I (4 Hrs)
General Physiology – Basic concepts

- Cell physiology including transportation across cell membrane
- Body fluid compartments, Distribution of total body fluid, intracellular and extracellular compartments, major electrolytes and maintenance of homeostasis
- Cell cycle
- Tissue – formation, repair
- Membranes and glands – functions

UNIT - II (6 Hrs)
Respiratory system

- Functions of respiratory organs
- Physiology of respiration
- Pulmonary circulation – functional features
- Pulmonary ventilation, exchange of gases
- Carriage of oxygen and carbon-dioxide
- Exchange of gases in tissue
- Regulation of respiration
- Hypoxia, cyanosis, dyspnea, periodic breathing
- Respiratory changes during exercise

UNIT III (8 Hrs)
Digestive system

- Functions of the organs of digestive tract
- Saliva – composition, regulation of secretion and functions of saliva
- Composition and functions of gastric juice, mechanism and regulation of gastric secretion
- Composition of pancreatic juice, functions, regulation of pancreatic secretion
- Functions of liver, gall bladder and pancreas
- Composition of bile and functions
- Secretion and functions of small and large intestine
- Movements of alimentary tract
- Digestion in mouth, stomach, small intestine, large intestine, absorption of food

UNIT- IV (6 Hrs)
Circulatory and Lymphatic system

- Functions of heart, conduction system, cardiac cycle, Stroke volume and cardiac output

• Blood pressure and Pulse • Circulation – principles, factors influencing blood pressure, pulse
• Coronary circulation, Pulmonary and systemic circulation
• Heart rate – regulation of heart rate • Normal value and variations
• Cardiovascular homeostasis in exercise and posture

UNIT-V (5Hrs)
Blood
• Blood – Functions, Physical characteristics
• Formation of blood cells
• Erythropoiesis – Functions of RBC, RBC life cycle
• WBC – types, functions • Platelets – Functions and production of platelets
• Clotting mechanism of blood, clotting time, bleeding time, PTT
• Homeostasis – role of vasoconstriction, platelet plug formation in hemostasis, coagulation factors, intrinsic and extrinsic pathways of coagulation
• Blood groups and types
• Functions of reticulo endothelial system, immunity

UNIT-VI (5Hrs)
The Endocrine system
• Functions and hormones of Pineal Gland, Pituitary gland, Thyroid, Parathyroid, Thymus, Pancreas and Adrenal glands.
• Other hormones
• Endocrine Alterations in diseases

UNIT-VII (4Hrs)
The Sensory Organs
• Functions of skin
• Vision, hearing, taste and smell
• Errors of refraction, aging changes

UNIT-VIII (6Hrs)
Musculoskeletal system
• Bones – Functions, movements of bones of axial and appendicular skeleton, Bone healing
• Joints and joint movements
• Joint diseases
• Properties and Functions of skeletal muscles – mechanism of muscle contraction
• Structure and properties of cardiac muscles and smooth muscles

UNIT- IX (4Hrs)
Renal system
• Functions of kidney in maintaining homeostasis
• GFR
• Functions of ureters, bladder and urethra
• Micturition
• Regulation of renal functions
UNIT- X (4Hrs)
The Reproductive system
• Female reproductive system – Menstrual cycle, function and hormones of ovary, oogenesis, fertilization, implantation, Functions of breast
• Male reproductive system – Spermatogenesis, hormones and its functions, semen

UNIT- XI (8 Hrs)

Nervous system

- Overview of nervous system
- Review of types, structure and functions of neurons
- Nerve impulse
- Review functions of Brain-Medulla, Pons, Cerebrum, Cerebellum
- Sensory and Motor Nervous system
- Peripheral Nervous system
- Autonomic Nervous system
- Limbic system and higher mental Functions - Hippocampus, Thalamus, Hypothalamus
- Vestibular apparatus
- Functions of cranial nerves
- Autonomic functions
- Physiology of Pain-somatic, visceral and referred
- Reflexes
- CSF formation, composition, circulation of CSF, blood brain barrier and blood CSF barrier

Practical's :

- Hemoglobinometry
- White Blood Cell Count
- Red Blood Cell Count
- Determination of Blood Groups
- Leishman's Staining and Differential WBC Count
- Determination of Packed Cell Volume
- Erythrocyte Sedimentation Rate (ESR)
- Determination of Clotting Time, Bleeding Time
- Recording of Blood pleasure
- Auscultation for Heart sounds
- Artificial Respiration
- Determination of Vital capacity.

Reference Books :

1. Sembulingam (K), Essentials of Medical Physiology, Jaypee, 8th Edi, 2019.
2. Guyton & Hall, Textbook of Medical Physiology, Elsevier, 2nd Edi, 2018.
3. Pal (GK), Comprehensive Textbook of Medical Physiology, Jaypee, 2nd Edi, Vol I & II, 2019.
4. Surinder Singh, Principles of Human Physiology for Course in Nursing & Allied Health Sciences, CBS, 2017.
5. Ross and Wilson Anatomy and Physiology in Health and illness, Elsevier, 13th Edi, 2018.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

3. GENERAL BIOCHEMISTRY
Course Code: BOPT-003

Placement: Ist Year (Ist Semester) **Time:** Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist the students to acquire knowledge of the normal biochemical composition and functioning of human body, its alterations in disease conditions and to apply this knowledge in to practice.

COURSE OUTLINE

UNIT - I (3 Hrs)

- **Introduction to Biochemistry**

UNIT - II (3 Hrs)

- **Biophysical aspects of Biochemistry**

UNIT-III (7 Hrs)

Carbohydrates

- Chemistry of carbohydrates, Classification and biological importance
- Digestion and absorption, Glycolysis, glycogen metabolism, glucono-genesis, TCA cycle
- Regulation of blood glucose, Diabetes mellitus

UNIT-IV (7 Hrs)

Proteins

- Biological importance, Classification of amino acids & proteins
- Digestion and absorption
- Urea synthesis, Transamination

UNIT-V (7 Hrs)

Lipids

- Biological importance
- Classification of lipids, lipoproteins, Overview of lipid metabolism

UNIT-VI (6 Hrs)

Enzymes

- Classification, Factors affecting enzyme action
- Enzyme inhibition & Chemical enzymology

UNIT-VII (7 Hrs)

Endocrinology

- Hormones, Role of biological important hormones
- Pituitary, thyroid, adrenal cortex and medulla
- Sex hormones

UNIT-VIII (7 Hrs)

Mineral metabolism

- Regulation of blood level
- Consequences of excess and deficiency of calcium, Phosphate, iron, copper & zinc

UNIT-IX (7 Hrs)

Vitamins

- Fat soluble vitamins, Water soluble vitamins
- Biochemical function, Deficiency, Manifestation, Source & RDA

UNIT-X (6 Hrs)

Clinical Biochemistry

- LFT& RFT
- Urine analysis

Practical's:

- Simple Color reactions of Carbohydrates and Proteins
- Qualitative estimations of Glucose, Urea, Creatinine, Total Protein and Cholesterol
- Normal constituents of Urine
- Abnormal (pathological) Urine
- Glucose Tolerance Test and its significance
- Demonstration of Electrophoresis and Interpretation of important clinical conditions based on Electrophoresis appearance
- Demonstration of Paper Chromatography and its utility in the diagnosis of inborn errors of metabolism.

Reference Books:

1. Vasudevan (DM), Text Book of Biochemistry for Medical Students, Jaypee Pub,9th Edi, 2019.
2. Wilson & Walkers Principles & Techniques of Biochemistry & Molecular Biology, University Press, 8th Edi, 2018.
3. HarbansLal and Rajesh Pandey Textbook of biochemistry, CBS, 3rd Edi, 2017
4. Harold Varley, Practical Clinical Biochemistry, CBS, 4th Edi, 2010.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

4. PHYSICAL OPTICS

COURSECODE: BOPT-004

Placement: Ist Year (Ist Semester) **Time:**Theory:60 Hours

Practical : 30 Hours

Course Description: The course is designed to equip the students with a thorough knowledge of properties of light. At the end of this course, students will be able to predict the distribution of light under various conditions.

UNIT-I (10 Hrs)

Nature of light

- Wave Nature of Light–Short coming of wave theory Quantum
- Theory–Dual Nature of Light
- Mathematical Representation of Wave–S.H.M.–energy composition of S.H.M.ina straight line and right angles
- Huygens' s principle–Laws of reflection and refraction at spherical surfaces and lenses.

UNIT-II (5 Hrs)

Radiometry & Photometry

- Lambert'scosine Law
- Basic concepts and definitions in Photometry
- Lummen Brodhun Photometer

UNIT-III (15 Hrs)

Interference

- Description of the phenomena, Young's experiment, coherent sources, phase and path difference, intensity, Theory of interference fringes.
- Interference in thin films–Interference due to reflected and transmitted light Lloyd's single mirror
- Colours of thin films–wedge shaped thin films–testing of planenessso f surface Newton's
- rings experiment–refractive index of liquid
- Non-reflecting films
- Visibility of fringes–contrast and contrast threshold.

UNIT-IV (10 Hrs)

Diffraction

- Single slit, qualitative and quantitative Circular aperture
- Double slit pattern and Kirchhoff's integral Multiple slits–grating
- Reflection grating and the zone plate

UNIT-V (10 Hrs)

Polarization

- Polarization of transverse waves–light as transverse waves
- Double refraction, principal plane, nicolprism–plane polarization
- Circular,elliptic polarization production, detection and behavior
- Optical activity– Fresnel's half shade polarimeter
- Polarization by selective
- absorption–dichorism.

UNIT-VI (10 Hrs)

Spectrum & Scattering

- Sources of spectrum, Bunsen– carbon–mercury–sodium
- Emission and absorption spectra –classification–visible–ultraviolet and infra spectra – electromagnetic spectrum
- Rayleigh's scattering
- Raman scattering

TEXTBOOKS/REFERENCEBOOKS:

1. Subrahmanyan N,BrijLal,A textbook of Optics,S.ChandCoLtd,NewDelhi, India,2003.
2. PedrottiL.S, PedrottiSr.F.L, Optics and Vision, PrenticeHall,NewJersey,USA,1998.
3. Keating NM.P, Geometric, Physical and Visual Optics,Butterworth-Heinemann,Massachusetts,USA,2002

PRACTICALS

1. Refractive index of prism for sodium D-Line using spectrometer
2. Air wedge- Interference method to find diameter of an optically thin wire
3. Newton's ring-to find sodium light
4. Biprism-To find sodium light
5. Polarimeter–specific rotation of dextrose and concentration of IV injection
6. Lummen brodem Photometer-Comparison of luminous power
7. μ of liquid –using liquid prism-spectrometer
8. Michelson interferometer-wave length of laser light

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question - 2 X 10 = 20 marks
Short answer question - 8 X 5 = 40 marks
Very Short answer - 10 X 2 = 20 marks

COMMUNICATION AND SOFT SKILLS
Course Code: BAECT-C01

Placement: Ist Year (Ist Semester) **Time:** Theory: 60 Hours

Course Description: The course is designed to enable students to enhance their ability to speak and write the language (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experience.

UNIT - I (10 Hrs)

Review of Grammar

- Remedial study of Grammar
- Building Vocabulary
- Phonetics
- Public Speaking

UNIT - II (3 Hrs)

Communication

- What is communication?
- What are communication roles of listeners, speakers, readers and writers as health care professionals?

UNIT- III (5 Hrs)

Introduction to LSRGW

- L–Listening: Different types of listening
- S–Speaking: Understanding Consonants, Vowels, Word and Sentence Stress, Intonation
- R–Reading: Medical vocabulary
- Gr–Grammar: Understanding tenses, linkers
- W–Writing simple sentences and short paragraphs –emphasis on correct grammar

UNIT- IV (7 Hrs)

Attentive Listening

- Focusing on listening in different situations, announcements, descriptions, narratives ,instructions, discussions, demonstrations
- Reproducing Verbatim
- Listening to academic talks/lectures
- Listening to presentation

UNIT – V (12Hrs)

Effective Conversation

- Conversation situations–informal ,formal and neutral
- Factors influencing way of speaking–setting ,topic, social relationship ,attitude and language
- Greetings,introductions,requesting,askingforandgivingpermission,speakingpersonallyandcasualconversations
  - Asking for information, giving instructions and directions
  - Agreeing and disagreeing ,giving opinions
  - Describingpeople,places,eventsandthings,narrating,reporting&reachingconclusions

- Evaluating and comparing
- Complaints and suggestions
- Telephone conversations
- Delivering presentation

UNIT-VI (8 Hrs)

Reading

- Reading strategies ,reading notes and messages
- Reading relevant articles and news items
- Vocabulary for everyday activities ,abbreviations and medical vocabulary
- Understanding visuals ,graphs, figures and notes on instructions
- Reading reports and interpreting them
- Using idioms and phrases, spotting errors, vocabulary for presentations
- Remedial Grammar

UNIT- VII (7 Hrs)

Writing Skills

- Writing patient history
- Note taking
- Summarizing
- Anecdotal records
- Letter writing
- Diary/Journal writing
- Report writing
- Paper writing skills
- Abstract writing

UNIT VIII (8 Hrs)

LSRW Skills

- Critical thinking strategies for listening and reading
- Oral reports ,presentations
- Writing instructions, letters and reports
- Error analysis regarding LSRW

Reference Books:

1. Clement, I, Essentials of English for Paramedical Courses, EMMESS,2nd Edi,2018.
2. Lakshminarayanan K.R., English for Technical Communication,Scitech publication, 2nd Edi2015

5. OCULAR ANATOMY
COURSE CODE: BOPT-005

Placement:Ist Year (IInd Semester) **Time:**Theory: 60Hours
Practical**:**30Hours

Course Description: The course is designed to Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa..Identify the microscopic structures of various tissues in the eye and correlate the structure with the functions. Comprehend the basic structure and connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution. To understand the basic principles of ocular embryology.

UNIT-I (10 Hrs)

Structure of the eye

- Wall of the eye ball
- Sclera
- Cornea
- Choroid and ciliary bodies
- Lacrimal apparatus

UNIT-II (10 Hrs)

Ocular movements

- Extra ocular muscle
- Intra ocular muscle
- Movements in vertical axis
- Movements in transverse axis
- Movements in anterior posterior axis
- Simultaneous movements of both eyes

UNIT-III (10 Hrs)

Visual process

- Retina
- Histology of retina
- Structure of rods
- Structure of cones

UNIT-IV (10 Hrs)

Refractive media

- Aqueous humor
- Anterior and posterior chamber
- Lens
- Eyelid
- Conjunctiva

UNIT-V (10 Hrs)

Field of vision

- Temporal and nasal fields
- Upper and lower fields
- Blind spot & macula Lutea

UNIT-VI (10 Hrs)

Visual pathway

- Optic nerve, optic chiasma, optic tract, lateral geniculate body, optic radiation, visual Cortex.

TEXTBOOKS&REFERENCEBOOKS:

1. Manipal manual of anatomy by Sampath Madhyastha
2. Ross and willson, Anatomy and physiology and health illness.
3. B.Dchaurasia, General human anatomy.
4. B.Dchaurasia, Regional Anatomy vol.I,II&III.
5. Richard.S.Snell: Clinical anatomy.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

6. OCULAR PHYSIOLOGY
COURSE CODE: BOPT-006

Placement: Ist Year (IInd Semester) **Time:**Theory: 60Hours
Practical**:**30Hours

Course Description: The course is designed to :
Explain the normal functioning of all structures of the eye and their interactions Elucidate the physiological aspects of normal growth and development of the eye
Understand the phenomenon of vision. List the physiological principles underlying pathogenesis and treatment of diseases of the eye.

UNIT-I(10 Hrs)

Structure of the eye

- Wall of the eye ball: outer layer, middle layer,inner layer
- Fundus oculi: Opticdisc–Blindspot-Maculalutea
- Intraocular fluid: Vitreous humor-Aqueous humor-Intraocular pressure
- Iris & pupil
- Lens: Structure-changes in the lens during old age
- Applied physiology: Glaucoma, Cataract

UNIT-II (10 Hrs)

Visual process

- Neural basis of visual process
- Optics of vision, image forming mechanism
- Structure of rod cell, structure of conecell, functions of rods and cones
- Chemical basis of visual process rhodopsin, photo transduction, photosensitive pigments in cones, dark adaptation, light adaptation, night blindness
- Electrical basis of visual process–electro retinogram,definition, method of recording ERG ,waves of ERG
- Visual Acuity–Definition,Tests
- Refractive Errors
- Optics of eye
- Accommodation of eye

UNIT-III (10 Hrs)

Field of vision

- Definition-Binocular and monocular vision
- Corresponding retinal points, diplopia, blind spot,visual field and retina, mapping of visual field
- Depth Perception
- Principles of ophthalmoscope

UNIT-IV (10 Hrs)

Visual pathway

- Introduction-visual receptors, first order neurons, second order neurons, third order neurons
- Connections of visual receptors to optic nerve, private pathway, diffuse pathway

- Organization and functions of Visual Cortex
- Visual processing in LGN opthalamus
- Lateral inhibition by a macrine & horizontal cells
- Impulses reaching other areas of brain for other function
- Applied physiology–effects of lesion at different level of visua pathway

UNIT-V(10 Hrs)

Pupillary reflex

- Light reflex, direct light reflex, indirect light reflex, pathway for lighter flex,ciliospinal reflex
- Accommodation-definition, mechanism of accommodation, accommodation, pathway for accommodation reflex, range and amplitude of accommodation
- Types of eye movement and their control
- Applied physiology-Argyll Roberts on pupil, Horner syndrome, presbyopia

UNIT-VI (10 Hrs)

Color vision

- Theories of color vision-Thomas young trichromatic theory,Helmholtz trichromatic theory-Granit dominator-modulator theory-Hartridge polychromatic theory, herring's theory of opposite colors
- Appliedphysiology–colorblindness,causesforacquiredcolorblindness,classification of color blindness, tests for color blindness

TEXTBOOKS/REFERENCEBOOKS:

1. Basics of Medical Physiology (Thirdedition) by D.Venkatesh/H.H.Sudhakar
2. Medical physiology forunder graduates by Indhu Khurana,
3. Chaudhari (SujithK) Concise Medical Physiology 6th Ed.New Central Book.
4. Guyton (Arthur)Text Book of Physiology.11thEd.PrismPublishers.
5. Online references: www.elsevier/medical/physiology

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

7. OCULAR BIOCHEMISTRY
COURSE CODE: BOPT-007

Placement: Ist Year (IInd Semester) **Time:**Theory:60Hours
Practical**:**30Hours

Course Description:

Ocular Biochemistry is an in-depth course designed to explore the biochemical processes and molecular mechanisms that underpin the function and health of the eye. This course provides a comprehensive understanding of the biochemical composition of ocular tissues, the metabolic pathways involved in vision, and the biochemical basis of ocular diseases. Emphasis is placed on the integration of biochemical knowledge with clinical practice in optometry and ophthalmology.

OCULARBIOCHEMISTRY

- Hormones Basic Concepts In Metabolic Regulation With Examples Say Insulin
- Various aspects of the eye,viz., cornea, lens, aqueous, vitreous, retina and pigment rhodopsin.(The important chemicals in each and their roles.)
- Technique-Electrophoresis Molar and Percentage Solution, Photometer, Colorimeter and Spectrometry, Radio Isotopes.

Tearfilm:-Formation and regulation (Hormonal and Nerves control), Layers, Structure, Biochemical composition, stability, functions and abnormalities.

Cornea: - Biochemical composition including protein and enzymes and electrolyte, specialty of protein arrangement, dehydration, Regulation of dehydration, transparency and refractive power. Abnormalities and Changes in contact lens wearer

Aqueous humor:-Formation and regulation, Biochemical composition, abnormalities and changes in Contact lens wearer.

Lens:-Structure and Functions of Lens. Zonules. Biochemistry, Protein fractions, Electrolytes, Dehydration and Transparency. Cataract- classifications, cataractogenic agents. Diabetic cataract.

Reference Books:

1. S.Ramakrishnan:Essentialsofbiochemistryandocularbiochemistry,AnnamalaiUniversityPublications
2. DavidR.Whikehart-Biochemistry of eye(2003)(2nded)
3. Satyanarayana (2021)-Biochemistry(6thed)
4. AKKhurana-comprehensiveophthalmology2023(9ed)

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

8. OCULAR PATHOLOGY & OCULAR MICROBIOLOGY
COURSE CODE: BOPT-008

Placement: Ist Year(IIndSemester) **Time:**Theory:60Hours
Practical**:**30Hours

Course Description: The course is designed for the students to acquire knowledge in Inflammation and repair aspects. Pathology of various eye parts and adnexa. To understand the pathogenes is of the diseases caused by the organisms in the human body with particular reference to the eye infections and to understand basic principles of diagnostic ocular Microbiology.

Ocular Pathology (30 Hrs)

- Eyelid [normal and pathology including inflammations and tumours]
- Cornea[Normal and pathology in degeneration and dystrophies]
- Lens[normal and pathology of cataract]
- Retina[normal and pathology in inflammatory diseases, infections]
- Intraocular tumours [Retino blastoma and choroidal melanoma]
- Orbit [inflammation and neoplasia]
- Optic nerve [normal and tumours]

TEXTBOOK & REFERENCE BOOKS:

1. KS Ratnagar:Pathology of the eye & orbit, Jaypee brothers Medical Publishers, 1997
2. CORTONKUMAR ANDROBINS: Pathological Basis of the Disease, 7thEdition, Elsevier, NewDelhi,2004.
3. SRLakhani Susan AD & CarolineJF: Basic Pathology: An introduction to the mechanism of disease,1993.

Ocular Microbiology (30 Hrs)

Common bacterial infections of the eye

- Staphylococcus
- Pneumococcus
- Neisseria
- Corynebacterium
- Pseudomonas
- Haemophilusaegypticus

Common fungal infections of the eye

- Candida
- Aspergillus
- Cryptococcus
- Dimorphic fungi

Common Viral infections of the eye

- Introduction to Virology
- Herpes virus
- Adeno virus

- Parainfluenza virus
- Coxsackie virus.

TEXTBOOK &REFERENCE BOOKS

1. Textbook of Microbiology by C.P.Baveja
2. Textbook of Microbiology by Ananthanarayanan
3. Medical Microbiology by Satish Gupte
4. Medical laboratory Technology Vol.I, II, III by Mukherjee

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

Section A – Ocular Pathology: 40 Marks
Pattern of Question Paper:

Long answer question	- 1 X 10 = 10 marks
Short answer question	- 4 X 5 = 20 marks
Very Short answer	- 5 X 2 = 10 marks

Section B – Ocular Microbiology: 35 Marks
Pattern of Question Paper:

Long answer question	- 1 X 10 = 10 marks
Short answer question	- 3 X 5 = 15 marks
Very Short answer	- 5 X 2 = 10 marks

Mark Distribution for Internal Assessment:

Ocular Pathology	- 15 Marks
Ocular Microbiology	- 10 Marks
Total	25 Marks

9. GEOMETRICAL OPTICS
COURSE CODE: BOPT- 009

Placement: IstYear (IInd Semester) **Time:**Theory:60Hours
Practicals:30 Hours

Course Description: The course is designed to equip the students with a thorough knowledge of mirrors and lenses. At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye.

UNIT-I (10 Hrs)

Propertiesof light

- Rectilinear propagation, reflection, refraction, ray, beam
- Umbra, penumbra, pin hole camera

UNIT-II (10 Hrs)

Refraction through spherical surfaces

- Introduction: Lens shapes, Vergences and conversion factors, divergence and convergence of wave fronts by spherical surfaces, definition of dioptre, working of spherical lenses-primary and secondary focal points–predictable rays.
- Prism diopter, Prentices Law, deviations,Ophthalmic prisms–thin and thick
- Spherical refracting interfaces–convex, concave, derivation of vergence equation, saggitas, and dioptric power– focal points, nodal points and plane. Symmetry points, imaging examples, lateral magnification.
- Thick lenses– front and back vertex powers–reduced system–dioptricpowerof equivalent lenses, cardinal points.
- Cylindrical and sphero cylindrical lenses: -principle meridians, refraction by a cylindrical lens, calculation of power in different meridians, sphero cylindircal lenses, circle of least confusion, interval of sturm, refraction through asphero cylindrical lens, writing Rx indifferent forms (+cyl., meridional),additional phero–cylinders, oblique- cylinders.

UNIT-IV (10 Hrs)

Aberrations:

- Chromatic aberrations–cause and methods of minimizing, achromatic doublet
- Monochromatic aberrations–first order and third order theory.
- Spherical aberrations, coma, astigmatism, curvature,distortion–cause and the methods of minimizing aberrations

UNIT-V (10 Hrs)

Laser optics:

- Basic laser principles–spontaneous and stimulated emission.Coherence–spatial, temporal, Laser pumping– population inversion optical feedback
- Monocular laser–carbondi oixide, eximer laser. Semi conductor lasers. Lasers in Medicine ophthalmic applications Gaslasers, and solid lasers, Helium –neonlaser–argon– ion laser–ruby laser

UNIT-VI (10 Hrs)

Principles of lighting:

- Modern theory on light & colour: Synthesis of light
- Light & vision: Discomfort glare, visual ability, relationship among Lighting, visibility and task performance
- Photometry: Measurement of illumination, photometers and filters

LIST OF EXPERIMENTS:

1. Liquid Lens-Determination of “f ” and "μ"
2. Focal Length of Lenses
3. Concave lens-in combination with a convex lens-power determination
4. Construction of a tabletop telescope all three types of telescopes
5. Fresnel's Biprism-determine the wavelength of a monochromatic light source
6. Photoelectric effect-determine Planck's constant using photocell
7. Air Wedge-Determination of Diameter of Thin Wire
8. Newton's Rings-determine the radius of curvature of convex surface of a lens
9. Refractive Index of Solid Prism
10. Determination of the radil of curvature of a bi-convex and bi-concave lens using spherometer and lens gauge
11. Reflection through Spherical mirrors

TEXTBOOK & REFERENCE BOOKS:

1. Tunnacliffe A.H, HirstJ.G, Optics,The association of British Dispensing Opticians, London, U.K.,1990.
2. PedrottiL.S, PedrottiSr.F.L, Optics and Vision,PrenticeHall,NewJersey,USA,1998.
3. Loshin D.S.The Geometric Optics Work book, Butter worth-Heinemann, Boston, USA,1991.
4. Schwartz S.H.Geometrical and Visual Optics: A Clinical Introduction, McGraw-Hill, NewYork, USA, 2002.

Examination Pattern

Subject		**Duration**
Theory exam:	80 marks	3 hours
Practical exam:	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	
	200 marks	

The practical examination will have the following components:

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 8 X 5 = 40 marks
Very Short answer	- 10 X 2 = 20 marks

COMPUTER APPLICATION
Course Code: BAECT-C02

Placement: Ist Year (IInd Semester) **Time:** Theory:30 Hours
Practical**:**30Hours(Lab)

Course Description:
The course is designed for student to acquire the knowledge, develop basic understanding, use of computer and its applications in clinical field.

UNIT- I (10 Hrs)
Introduction to Computer

- Concepts of computers
- Hardware and Software
- Trends and Technology
- Applications of Computer

UNIT- II (10 Hrs)
Introduction to Disk Operating System (DOS)

- Windows (allversion)
- MS Word
- MS Excel with Pictorial Presentation
- MS-Access
- MS-PowerPoint

UNIT- III (5 Hrs)
Statistical packages

- Types and their features

UNIT- IV (5 Hrs)
Hospital Management System

- Types and uses
- Electronic patient records

Reference Books:

1. Bansal Surabhi, Computer Applications for Allied Health Sciences, AITBS, 1st Edi, 2022.
2. PriyankaRandhir, Computer for Paramedical,CBS, 1st Edi, 2020
3. Pooja Jain &NeelamKumari, Introduction to Computer, S.Vikas& Co, 5th edi, 2019
4. Shah Y.I, Paradkar A.R et.al, Introduction to Biostatistics and Computer Science, NiraliPrakashan Pub, 16th Edi, 2019.

10. VISUAL OPTICS -I
COURSE CODE: BOPT-010

Placement: II[nd] Year (III[rd]Semester) **Time:**Theory:60Hours
Practical :30 Hours

Course Description: The course is designed to understand the fundamentals of optical components of the eye and to gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.

UNIT-I (15 Hrs)

Review of geometrical optics vergence and power

- Conjugacy, object space and image space.
- Sign convention Spherical refracting surface, Spherical mirror; catoptrics power, Cardinal points, Magnification
- Light and visual function
- Clinical Relevance of: Fluorescence, Interference, Diffraction, Polarization, Birefringence, Dichroism
- Aberration and application, Spherical and Chromatic

UNIT-II (10 Hrs)

Optics of ocular structure

- Cornea and aqueous
- Crystalline lens
- Vitreous
- Schematic and reduced eye

UNIT-III (10 Hrs)

Measurements of optical constants of the eye

- Corneal curvature and thickness, Keratometry
- Curvature of the lens and ophthamophakometry
- Axes and axis of the eye

UNIT-IV (10 Hrs)

Basic aspects of vision

- Visual Acuity,
- Light and Dark Adaptation,
- Color Vision,
- Spatial and Temporal Resolution

UNIT-V (15 Hrs)

Refractive anomalies

- Etiology of refractive anomalies
- Contributing variability and their ranges
- Populating distributions of anomalies.
- Optical component measurements
- Growth of the eye in relation to refractive errors

TEXTBOOKS&REFERENCEBOOKS:

1. AH Tunnacliffe:Visualoptics,TheAssociationofBritishOptician,1987
2. AG Bennett &RB Rabbets: Clinical Visual optics,3rd edition,ButterworthHeinemann,1998
3. WJ Benjamin:Borish'sclinicalrefraction,2nd edition,ButterworthHeinemann,Missouri, USA, 2006
4. T Grosvenor:PrimaryCareOptometry,4th edition,Butterworth–Heinemann,USA,2002
5. MP Keating:Geometric,PhysicalandVisualoptics,2nd edition,Butterworth-Heinemann, USA, 2002
6. HL Rubin: Optics for clinicians,2nd edition, Triad publishing company.Florida,1974.
7. H Obstfeld: Optic in Vision-Foundations of visualoptics&associatedcomputations,2nd edition, Butterworth, UK,1982.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

11. OPTOMETRIC OPTICS-I
COURSE CODE: BOPT- 011

Placement: II[nd] Year (III[rd] Semester) **Time:**Theory:60 Hours
Practical :30 Hours

Course Description: The course is designed to understand:

1. Measurement of lenspower, lens centration using conventional techniques
2. Transposition of various types of lenses• Knowledge to identify different forms of lenses (equi-convex, plano convex, periscopic, etc.)
3. Knowledge to select the tool power for grinding process.
4. Measurement of surface powers using lens measure.
5. Method of laying off the lens for glazing process.
6. Ophthalmicprismknowledge–effects,units,base-apexnotation,compoundingandresolving prisms

UNIT-I (15 Hrs)

- Introduction–Light, Mirror, Reflection, Refraction and Absorption
- Lenses–Definition, units, terminology used to describe form of lenses
- Lens shape,size and types i.e.spherical, cylindrical and Sphero-cylindrical
- Vertex distance and vertex power, Effectivity calculations
- Spherometer & Sagformula,Edge thickness calculations
- Magnification in high pluslenses, Minification in high minus lenses
- Tilt induced power in spectacles
- Aberration in Ophthalmic Lenses

UNIT-II (15 Hrs)

- Transpositions–Simple, Toric and Spherical equivalent
- Prisms – Definition, properties, Refraction through prisms, Thickness difference, Base apexnotation,uses, nomenclature and units,Sign Conventions, Fresnel'sprisms, rotary prims
- Prismatic effect, centration, decentration and Prenticerule,
- Prismatic effect of Plano-cylinder and Sphero-cylinderlenses

UNIT-III (15 Hrs)

- History and General Outline-Manufacturing of Ophthalmic Blanks–Raw materials, Glass & Plastics
- Terminology used in Lens Workshops
- Surfacing process
- Definition & Materials (Glass, Plastics, Polycarbonate,Trivex)
- Types and Characteristics Properties (Refractive index, specific gravity, UVcut off, impact resistance–included rop ball test, abbe value, Center thickness)

UNIT-IV (10 Hrs)

- DesignofHigPoweredLenses-Hi-indexlenses,CalculationofRefractiveindex
- Bifocaldesigns,theirmanufacturing&uses(Kryptok,UnivisD,Executive,Invisible, Occupational)
    - Progressive Addition Lenses, modified near vision lenses(designs, advantages, limitations)
    - Knowledge of prism and decentration in ophthalmic lenses

- Knowledge of different types of materials used to make lenses and its characteristics
- Knowledge on lens designs–single vision, bifocals, progressive lens
- Knowledge on tinted and protective lenses
- Knowledge on special lenses like iseikonic, spectacle magnifiers.
- Knowledge on spectacle frames–manufacture, materials

UNIT-V (5 Hrs)

- Lensenhancements (Scratch resistant coatings –spin/dip,Anti-reflection coating, UVcoating, Hydrophobic coating, anti-static coating
- Lensdefects–DescriptionandDetectionGlazing&edging(manual&automatic)
- Design of High-Powered Lenses-Hi-index lenses.

SPECIALLENSES

- Lenticulars
- Aspheric
- Fresnel lenses & Prisms
- Aniseikonic lenses
- Photochromic
- Polaroid's
- Tinted lenses–Tints, filters

TEXTBOOKS&REFERENCEBOOKS:

1. JalieM:The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London,1972
2. CVBrooks,IMBorish: System for Ophthalmic Dispensing, Second edition, Butterworth Heinemann, USA,1996

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

12. OPTOMETRIC INSTRUMENTATION
COURSECODE: BOPT-012

Placement: IInd Year (IIIrd Semester) **Time:**Theory:60 Hours
Practical**:**30 Hrs

Course Description: The course is designed to the students to be skilled in knowing the purpose, set-up and devices required for the test, indications and contra indications of the test, step-by-step procedures, documentation of the findings, and interpretation of the findings of the various clinical optometry procedures

UNIT-I (15 hrs)

Refractive instruments

- Opto types and MTF, Spatial Frequency
- Test charts standards
- Choice of test charts
- Trial case lenses
- Refractor(phoropter)head units
- Trial frame design
- Near vision difficulties with units and trial frames
- Retinoscope–types available
- Adjustment of Retinoscopes-specialfeatures
- Vision analyzer
- Pupillometer
- Potential Acuity Meter
- Abberometer

UNIT-II (15 hrs)

Ophthalmo scopes and Related devices

- Design of ophthalmoscopes-illumination
- Design of ophthalmoscopes-viewing
- Ophthalmoscope disc
- Filters for ophthalmoscopy
- Indirect ophthalmoscopy

UNIT-III (10 Hrs)

- Lensometer, Lens gauges or clock
- Slit Lamp
- Tonometer's
- Keratometer and corneal topography
- Refractometer

- Orthoptic Instruments (SynoptophoreOnly)
- Color Vision Testing Devices
- Field Of Vision and Screening Devices
- AScans & Bscans
- ERG

UNIT-IV (15 Hrs)

- Examination of Visual System History taking,
- Visual acuity estimation
- Extraocular motility,
- Cover test,
- Alternating cover test
- Hirschberg test
- Modified Krimsky,
- Pupils Examination
- Maddox Rod
- Van Herrick

UNIT-V (15 Hrs)

- External examination of the eye,Lid Eversion
- Schirmer's, TBUT, NITBUT(keratometer),
- Color Vision,
- Stereopsis,
- Confrontation test,
- Slit lamp biomicroscopy,
- Direct Ophthalmoscopy,
- Digital pressure, Schiotz Tonometry, Applanation Tonometry
- Gonios copy
- Amsler test,
- Corneal Sensitivity,

TEXTBOOKS&REFERENCEBOOKS:

1. David Henson: Optometric Instrumentations,Butterworth-Heinemann,UK,1991
2. TGrosvenor:PrimaryCareOptometry,5th edition,Butterworth–Heinemann,USA,2007
3. GSmith,DA.Atchison:The Eye and Visual Optical Instruments, Cambridge University Press,1997
4. AKKhurana: Comprehensive Ophthalmology,4th edition,newageinternational(p)Ltd. Publishers, NewDelhi,2007
5. DB.Elliott:ClinicalProceduresinPrimaryEyeCare,3rdedition,Butterworth-Heinemann,2007
6. JackJ. Kanski Clinical Ophthalmology: A Systematic Approach,6th edition, Butterworth Heinemann,2007
7. J.BEskridge,JF.Amos,JD.Bartlett:ClinicalProceduresinOptometry,Lipincott Williams and Wilkins,1991

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

13. OCULAR DISEASE-I

COURSE CODE: BOPT-013

Placement: IInd Year (IIIrd Semester) **Time:**Theory:60 Hours
Practical : 30 Hrs

Course Description: The course is designed to the students to get knowledge in the following aspects of ocular diseases:

1. Etiology
2. Epidemiology
3. Symptoms
4. Signs
5. Diagnostic approach and
6. Management of the ocular diseases

UNIT-I (15 Hrs)

Orbit

- Applied Anatomy
- Classification, Causes, Investigations
- Proptosis
- Enophthalmos
- Developmental Anomalies-(craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome)
- Orbital Inflammations (Preseptal cellulites, Orbital cellulitis Orbital Periostitis, cavernous sinus Thrombosis)
- Grave's Ophthalmopathy
- Orbital tumors (Dermoids, capillary haemangioma,Optic nerve glioma)
- Orbital blow out fractures
- Orbital surgery(Orbitotomy)
- Orbital tumors
- Orbital trauma
- Approach to a patient with proptosis

UNIT-II (10Hrs)

Lids

- Applied Anatomy
- Congenital anomalies(Ptosis,Coloboma,Epicanthus,Distichiasis,Cryptophthalmos)
- Oedema of th eeye lids(Inflammatory, Solid, Passiveedema)
- Inflammatory disorders (Blepharitis,ExternalHordeolum,Chalazion,Internal hordeolum, Molluscum Contagiosum)
- Anomalies in the position of the lashes and Lid Margin (Trichiasis, Ectropion, Entropion, Symblepharon, Blepharophimosis,Lagophthalmos,Blepharospasm,Ptosis).

UNIT-III (10Hrs)

Lacrimal system

- Applied Anatomy
- Tear Film
- The Dry Eye(Sjogren's Syndrome)

- The watering eye(Etiology, clinical evaluation)
- Dacryocystitis
- Dacryoadenitis

UNIT-IV (10Hrs)

Conjunctiva

- Applied Anatomy
- Inflammationsofconjunctiva(Infectiveconjunctivitis–bacterial,chlamydial,viral, Allergic conjunctivitis, Granulo matous conjunctivitis)
- Degenerative conditions (Pinguecula,Pterygium, Concretions)

UNIT-V(10Hrs)

Cornea

- Applied Anatomy and Physiology
- Congenital Anomalies (Megalocornea, Microcornea, Corneaplana, Congenital cloudy cornea)
- Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and Nonulcerative
- Etiological classifications: Infective, Allergic,Trophic,Traumatic,Idiopathic)
- Degenerations(classifications,Arcussenilis,Vogt'swhitelimbalgirdle,Hassal-henle bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodularde generation, Droplet keratopathy, Pellucid Marginal degeneration)
- Dystrophies (Reis Buckler dystrophy, Recurrent corneal erosionsyndrome,Granualr dystrophy, Lattice dystrophy, Macular dystrophy, cornea guttata, Fuch's epithelial endothelial dystrophy, Congenital hereditary endothelial dystrophy)
- Keratoconus, Keratoglobus
- Cornealo edema,Corneal opacity, Corneal vascularization
- Penetrating Keratoplasty

UNIT-VI (10Hrs)

Uvealtract and sclera

- Applied Anatomy,
- Classification of uveitis
- Etiology
- Pathology
- Anterior Uveitis
- Posterior Uveitis
- PurulentUveitis
- Endophthalmitis
- Panophthalmitis
- Pars Planitis
- Tumors of uvealtract(Melanoma)
- Episcleritis and scleritis
- Clinical examination of Uveitis and Scleritis

TEXTBOOKS/REFERENCEBOOKS:

1. AK Khurana:Comprehensive Ophthalmology,4th edition,New age international(p)Ltd. Publishers, New Delhi, 2007
2. StephenJ.Miller:ParsonsDiseasesoftheEye,18th edition,ChurchillLivingstone,1990
3. JackJ.Kanski Clinical Ophthalmology: A Systematic Approach,6thedition,Butterworth - Heinemann, 2007

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

14. CLINICAL EXAMINATION OF VISUAL SYSTEM
COURSECODE: BOPT-014

Placement: II[nd] Year (III[rd] Semester) **Time:**Theory:60Hours
Practical:30 Hrs

Course Description:

This course is to acquaint the students regarding basic history taking and basic examination technique of a patient attending the Out Patient Department with ophthalmic complaints. The student should also become familiar with certain diagnostic treatments like visual fields, macular function test,etcto confirm the clinical findings and to help aid in diagnosis.

CLINICALEXAMINATIONOFVISUALSYSTEM (60 Hrs)

1.History of the Ophthalmic subject.

- Ocular symptoms.
- The past prescription-itsinfluence.

2. Visual acuity testing-distance and near and colourvision.
3. Colour Vision–methods of testing, significance.
4. Examination of muscle balance.
5. Slit lamp examination.

- Examination of eye lids, conjunctiva and sclera.
- Examination of cornea.
- Examination of iris, ciliary body and pupil.
- Examination of lens.

6. Examination of intraocular pressure and examination of angle of anterior chamber.
7. Ophthalmoscopy-Direct and indirect.
8. Examination of fundus (vitreous and disc), choroid and retina).
9. Examination of lacrimal system.
10 Examination of the orbit.
11.Macular function test.
12.Visual field charting (central),(peripheral).
13.Neuro-ophthalmologicalexamination.

Text and Reference Books

a. External Eye Diseases– A Colour Atlas–MarkTWatts, Butter worth Heinemann.
b. Clinical Procedures for ocular examination -Carlson
c. External Eye Diseases a systemic approach Ian Mackie, Butter worth Heinemann.
d. Clinical Examination of Ophthal miccases –M.L.Aggarwal & L.C.Gupta,CBS Publishers,Delhi.
e. Clinical Opthalmology,JackK.Kansi, Butterworths,2ndedition,1989.
f. Basic and Clinical Sciences-American Optometric Association.
g. Clinical Procedures In primary eye care–David Elliot
h. Diagnosis of defective colour vision–Jennie Birch,Butter worth Heinemann.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

15. CLINICAL OPTOMETRY PRACTICAL - 1
COURSE CODE: BOPT-015

Placement: II[nd] Year (III[rd] Semester) **Time:**Practical/Clinical:120Hours

PRACTICAL:

1. Case sheet
2. History taking
3. Lensometry
4. Visual acuity
5. Tests for phorias and tropias
6. External examination
7. Slit lamp examination
8. Drugs and method of application
9. Do's and don'ts–papillary dilatation

The practical examination will have the following components: (Time 3 hrs)

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
Viva – Voce	25 marks
	75 marks
Practical Internal Assessment	25 marks
Total Marks	100 marks

MEDICAL PSYCHOLOGY

COURSE CODE : C03

Placement: IIYear (III Semester) **Time:**Theory:30Hours

Course Description:

Medical Psychology is a multi disciplinary field that integrates the principles of psychology and medicine to understand and address the psychological aspects of health, illness, and healthcare. This course provides a comprehensive overview of the theoretical foundations, research methodologies, and clinical applications of medical psychology.

MEDICALPSYCHOLOGY:

1. Introduction to Psychology-Definitions- Schools of thought; fields of Psychology.
2. Man in society.
3. Emotions and feelings.
4. Motivation-Human motivation.
5. Personality – what it is; concept of body image.
6. Normality and abnormality- major and minor psychiatric entities.
7. Why Medical Psychology?
8. The patient in his mileu-socio-economic aspects.
9. The patient-therapist relationship –The initial encounter- basic principles of the therapist.
10. Illness- it's impact on the patient.
11. Eye diseases-their impact on the patient.
12. The patient's adaptation to variants of normal cyinvision- prejudices and biases.
13. Rehabilitation of the blind.

16. VISUAL OPTICS-II

COURSE CODE: BOPT-016

Placement: IIndYear (IVthSemester) **Time:**Theory:60Hours
Practical: 30 Hours

Course Description: Upon completion of the course, the student should be able: To understand the fundamentals of optical components of the eye to gain the or ethical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.

UNIT-I (15 Hrs)

Refractive conditions

- Emmetropia
- Myopia
- Hyperopia
- Astigmatism
- Accommodation
- Pres byopia
- Anisometropia and Aniseikonia
- Aphakia and Pseudophakia

UNIT-II (10 Hrs)

Accommodation

- Far and near points of accommodation
- Correction of spherical ametropia
- Axial versus refractive ametropia
- Relationship between accommodation and convergence,AC/A ratio

UNIT-III (15 Hrs)

Objective refraction

- Streak Retinoscopy only
- Principle, Procedure,Difficulties and Interpretation of findings
- Transposition and Spherical equivalent
- Dynamic Retinoscopy-various methods
- Radical Retinoscopy and Near Retinoscopy
- Cycloplegic Refraction

UNIT-IV (10 Hrs)

Subjective Refraction

- Review of subjective refractive methods
- Cross cylinder methods for astigmatism, Astigmatic FanTest
- Difficulties in subjective and objective tests and their avoidance
- Ocular refraction versus spectacle refraction

UNIT-V (10 Hrs)

- Ocular accommodation versus spectacle accommodation
- Spectacle magnification and relative spectacle magnification
- Retinal image blur;depth of focus and depth of field
- Prescribing Prisms/Binocular Refraction

TEXTBOOKS/REFERENCEBOOKS:

1. AH Tunnacliffe: Visual optics,The Association of British Optician,1987
2. AG Bennett & RB Rabbets: Clinical Visual optics,3rd edition, Butterworth Heinemann,1998
3. WJ Benjamin:Borish'sclinicalrefraction,2nd edition,Butter worth Heinemann, Missouri,USA,2006
4. T Grosvenor: Primary Care Optometry, 4thedition,Butter worth–heinneman,USA,2002.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

17. OPTOMETRIC OPTICS - II

COURSE CODE: BOPT-017

Placement: IIndYear (IVthSemester) **Time:**Theory:60Hours
Practical **:**30 Hours

Course Description:

This course delves into advanced principles and applications of optometric optics, expanding on foundational knowledge acquired in previous studies. It is designed to equip students with a comprehensive understanding of the theoretical aspects of lenses, prisms, and optical systems used in optometry. Emphasis is placed on the physics of light, the design and function of corrective lenses, and the practical implications of optical theory in clinical settings.

Unit – I (10Hrs)

Introduction – Light, Mirror, Reflection, Refraction and Absorption
Prisms–Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units, Sign Conventions, Fresnel's prisms, rotary prims
Lenses–Definition, units, terminology used to describe, form of lenses Lens shape, size and types i.e. spherical, cylindrical and Sphero cylindrical

Unit–II (10 Hrs)

Vertex distance and vertex power, Effectivity calculations
Transpositions – Simple, Toric and Spherical equivalent
Prismatic effect, centration,decent ration and Prentice rule, Prismatic effect of Plano-cylinder and Sphero cylinder lenses
Spherometer & Sag formula, Edge thickness calculations Magnification in highplus lenses, Minification in high minus lenses Tilt induced power in spectacles
Aberration in Ophthalmic Lenses

Unit –III (15 Hrs)

Raw materials – History and General Outline, Manufacturing of Ophthalmic Blanks–Glass &Plastics, Terminology used in Lens Workshops, Surfacing process from Blanks to lenses
Definition & Materials (Glass, Plastics, Polycarbonate, Triology)types and Characteristics Properties (Refractive index, specific gravity, UV cutoff,impact resistance–include drop bal test, abbe value, Center thickness)

Unit – IV (10 Hrs)

Design of High Powered Lenses Hi-index lenses, Calculation of Refractive index Bifocal designs, their manufacturing &uses (Kryptok, Univis D, Executive, Invisible, Occupational)
Progressive Addition Lenses, modified near vision lenses (designs, advantages, limitations)

Unit –V (10 Hrs)

Lens enhancements (Scratch resistant coatings–spin/dip ,Anti reflection coating, UVcoating, Hydrophobic coating, anti-static coating
Lens defects–Description and Detection
Glazing & edging (manual & automatic)
Project to ensure awareness on lens availability in Indian market

Reference Books:

1. JalieM: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians
2. CVBrooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

18. OCULAR DISEASES-II
COURSE CODE: BOPT-018

Placement: IInd Year (IVthSemester) **Time:**Theory:60Hours
Practical :30 Hours

Course Description: At the end of the course the students will be knowledge able in the following aspects of ocular diseases: knowledge on,

1. Etiology
2. Epidemiology
3. Symptoms
4. Signs
5. Diagnostic approach ,and
6. Management of the ocular diseases.

UNIT-I (10 Hrs)

Retina and Vitreous

- Applied Anatomy
- Congenital and Developmental Disorders (Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery)
- Inflammatorydisorders(Retinitis:Acutepurulent,Bacterial,Virus,mycotic)
- Retina lVasculitis (Eales's)
- Retinal Artery Occlusion (Central retinal Artery occlusion)
- RetinalVeinocclusion(Ischaemic,NonIschaemic,Branchretinalveinocclusion)
- Retinal degenerations: Retinitis Pigmentosa, Lattice degenerations
- Macular disorders: Solar retinopathy, central serous retinopathy, cystoids macular edema, Age related macular degeneration.
- Retinal Detachement: Rhegmatogenous, Tractional, Exudative
- Retinoblastoma

UNIT-II (10 Hrs)

Ocular Injuries

- Terminology: Closed globe injury(contusion, lamellar laceration)Open globe injury (rupture, laceration, penetrating injury, peforating injury)
- Mechanical injuries(Extra ocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis)
- Non Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational)
- Clinical approach towards ocular injury patients

UNIT-III (15 Hrs)

Lens

- Applied Anatomy and Physiology
- Clinical examination
- Classification of cataract
- Congenital and Developmental cataract
- Acquired (Senile,Traumatic, Complicated, Metabolic, Electric,Radiational,Toxic)
- Morphological: Capsular, Subcapsular, Cortical, Supranuclear,Nuclear,Polar.
- Management of cataract (Nonsurgicalandsurgicalmeasures;preoperativeevaluation,Typesofsurgeries,)
- Complications of cataract surgery
- Displacement of lens: Subluxation ,Displacement
- Lenscoloboma, Lenticonus, Microsperophakia.

UNIT-IV (10 Hrs)

Clinical neuro-ophthalmology

- Anatomy of visual pathway
- Lesions of the visual pathway
- Pupillary reflexes and abnormalities (Amaurotic light reflex,Efferent pathway defect, Wernicke's hemianopic pupil, Marcusgunn pupil. Argyll Robetson pupil, Adie'stonic pupil)
- Opticneuritis,AnteriorIschemicopticneuropathy,Pappilloedema,opticatrophy
- Cortical blindness
- Malingering
- Nystagmus

UNIT-V (15 Hrs)

Glaucoma

- Applied anatomy and physiology ofanterior segment
- Clinical Examination
- Definitions and classification of glaucoma
- Pathogenesis of glaucomatous ocular damage
- Congenital glaucoma
- Primary openangle glaucoma
- Ocular hypertension
- Normal Tension Glaucoma
- Primary angle closure glaucoma(Primary angle closure suspect,Intermittent glaucoma ,acute congestive, chronic angle closure)
- Secondary Glaucoma
- Management: common medications, laser intervention and surgical techniques

TEXTBOOKS/REFERENCEBOOKS:

1. AKKhurana: Comprehensive Ophthalmology,4th edition,Newageinternational(p)Ltd. Publishers, NewDelhi,2007
2. StephenJ.Miller:Parsons Diseases of the Eye,18th edition,Church ill Livingstone,1990
3. JackJ.Kanski Clinical Ophthalmology:A Systematic Approach,6th edition, Butterworth Heinemann,2007

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question - 2 X 10 = 20 marks
Short answer question - 7 X 5 = 35 marks
Very Short answer - 10 X 2 = 20 marks

19. GENERAL & OCULAR PHARMACOLOGY
COURSE CODE: BOPT-019

Placement: IIndYear (IVthSemester) **Time:**Theory:60Hours
Practical: 30 hours

Course Description:
Pharmacology is the basis of Therapeutics. The students are taught actions, uses adverse effects and mode of administration of drugs for various diseases.

UNIT – I (15 Hrs)

GENERAL PHARMACOLOGY:

- Mechanisms of drug action.
- Dose-response relationships
- Pharmacokinetics of drug absorption, distribution , bio-transformation, excretion and toxicity.
- Factors influencing drug metabolism or drug action.

UNIT – II (15 Hrs)

PRINCIPLESOFOCULAR PHARMACOLOGY

- Preparation and packaging of ophthalmic drugs.
- General principles of ocular pharmacology.
- Drug actions and effectiveness.
- Drug safety.
- Factors influencing the objectively demonstrated response.
- Ocular penetration.
- Routes of general and ocular drug administration.

UNIT – III (10 Hrs)

OPTOMETRICDIAGNOSTICDRUGS:

- Optometric use of pharmaceuticals
- Classification of drug use.
- Topical ophthalmic drugs
- References and drug indices
- Hazards of ophthalmic drugs
- Surface active drugs
- Topical anesthetics

UNIT – IV (5 Hrs)

Principles and classification of autonomic drugs

- Sympathomimetics
- Sympatholytics
- Parasympathomimetics
- Parasympatholytics
- Diagnostic use of autonomic drugs.

UNIT – VI (5 Hrs)

Other drugs of Optometric interest

- Physicalagents
- Germicides and sterilizing agents
- Over-the-counter drugs
- Dyes and stains

UNIT – VII (10 Hrs)

OPHTHALMOLOGICALDRUGUSE:

- Anti-glaucoma drugs
- Drugs for ocular hypertension.
- Drugs that enhance aqueous outflow.
- Inhibitor sof aqueous secretion.
- Sulfonamides
- Antibiotics
- Corticosteroids
- Anaesthetics.

TEXTBOOKS/REFERENCE BOOKS:

a) Ocular Pharmacology &Therapeutics, Arvind Eye Hospital,Madurai.
b) Ocular Pharmacology & Therapeutics –Micheal Doughty,Butter worth Heinemann.
c) The Actions and uses of Ophthalmic Drugs 3rdedition–Cornor Davies Hopkins & Pearson(Jaypee)
d) O'Connor Davies'Ophthalmic Drugs–4thEdition–Hopkins,Pearson
e) Drugs, Medications & Eye–Michael Doughty
f) Clinical Ocular Pharmacology–4thedition–Bartlett,Jaanus, Butter worth Heinemann.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

20. CLINICAL OPTOMETRY PRACTICAL-II
COURSE CODE: BOPT-020

Placement: IIndYear (IVth Semester) Practical/Clinical:210 Hours

PRACTICALS:

The students are made to observe the internees initially, and then gradually they are encouraged To work up a patient, and perform various examination techniques

1. Direct Ophthalmoscopy
2. Indirect Ophthalmoscopy
3. Instrumentation
4. Patients selection
5. Keratometry reading
6. Refraction
7. Fluorescent pattern
8. Over refraction
9. Fitting of hard lenses
10. Rigid gas permeable lenses and soft lenses in refractive errors and in specialized condition

The practical examination will have the following components: (Time 3 hrs)

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
Viva – Voce	25 marks
	75 marks
Practical Internal Assessment	25 marks
Total Marks	100 marks

ENVIRONMENTAL SCIENCES
COURSE CODE: BOPT-C04

Placement:II Year(IV Semester) **Time:**Theory:30Hours

Course Description: The students should gain knowledge to understand the multidisciplinary nature of the environment and the awareness of the eco system, which maintains the natural environment.

UNIT-I

Multi-disciplinary nature of environ mental studies

- Definition
- Scope and importance
- Need for public awareness

UNIT-II

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 forest and tribal people.
- Water resources: Use and over-utilizationofsurfaceandgroundwater,floods,drought,conflictsover water, dams-benefits and problems.
- Mineral resources: Use and exploitation, environmental effect so extracting and using mineral resources
- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.
- Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
- 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-III

- 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.
- Introduction, types, characteristic features, structure and function of the following ecosystems:-
    - Forest ecosystem
    - Grassl and ecosystem
    - Desert ecosystem
    - Aquatic ecosystems(ponds,streams,lakes,rivers,oceans,estuaries)

UNIT-IV

Biodiversity and its conservation

- Introduction–Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity: consumptive use, productiveuse, social, ethical,aestheticandoption values.
- Biodiversity at global ,National and local levels.
- India as a mega-diversity nation.
- Hot-sports of biodiversity.
- Threats to biodiversity: habit at loss, poaching of wildlife, man-wild life conflicts.
- Endangered and endemic species of India
- Conservation of bio diversity:In-situ and Ex-situ conservation of bio diversity.

UNIT-V

Environmental Pollution

- Definition Cause, effects and control measures of:-
    - Air pollution
    - Water pollution
    - Soil pollution
    - Marine pollution
    - Noise pollution
    - Thermal pollution
    - Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

UNIT-VI

Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, water shed management
- Resettlement and rehabilitation of people;Its problems and concerns.
- Case Studies
- Environmental ethics:Issues and possible solutions.
- Climate change, global warming, acidrain, ozonelayer depletion,nuclear accidents and holocaust. Case studies.
- Wastel and reclamation.
- Consumer is mand waste products.
- Environment Protection Act.
- Air(Prevention and control of Pollution) Act.
- Wild life Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation

UNIT-VII

Human Population and the Environment

- Population growth, variation among nations.
- Population explosion–Family Welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case studies

Reference Books:

1. Agarwal,R.K, Environmental Science,Krishna Prakashan,1st Edition.2020.
2. Bharucha Erach,The Biodiversity of India, MapinPublication,1st edition,2002.

21. CONTACT LENS-I

COURSE CODE:BOPT-021

Placement: IIIrdYear(VthSemester) **Time:**Theory:60Hours
Practical:30Hours

Course Description: Upon completion of the course, the student should be able to:
Understand the basics of contact lenses
List the important properties of contact lenses
Finalise the CL design for various kinds patients
Recognize various types of fitting
Explain all the procedures to patient
Identify and manage the adverse effects of contact lens

UNIT-I (10 Hrs)

Introduction to Contact lenses

- Definition
- Classification/Types
- History of Contact Lenses

UNIT-II (10 Hrs)

Optics of Contact Lenses

- Magnification & Visual field
- Accommodation & Convergence
- Back & Front Vertex Power/Vertex distance calculation

UNIT-III (10 Hrs)

- Introduction to CLmaterials-Monomers, Polymers
- Properties of CL materials
  -Physiological (Dk,Ionicity,Watercontent)
  -Physical (Elasticity,Tensile strength, Rigidity)
  -Optical (Transmission, Refractive index)
- Manufacturing Soft Contact Lenses–various methods

UNIT-IV (15 Hrs)

- Indications and contra indications
- Parameters/Designs of Contact Lenses &Terminology
- Pre-fitting considerations for SCL
- Fitting philosophies for SCL
- SCL fitting assessment
- Types offit–Steep,Flat,
- Optimum Calculation and finalizing SCL parameters
- Disposable lenses Advantages and availability

UNIT-V (15 Hrs)

- Common Handling Instructions
  -Insertion & Removal Techniques

-Do's and Dont's

- Care and Maintenance of Soft lenses
  -Cleaning agents & Importance
  -Rinsing agents & Importance
  -Disinfecting agents & importance
  -Lubricating & Enzymatic cleaners
- Follow up visit examination
- Complications of Soft lenses
- Therapeutic contact lenses
  -Indications
  -Fitting consideration

TEXTBOOKS/REFERENCEBOOKS:

1. IACLEmodules1-10
2. CLAOVolumes1,2,3
3. AnthonyJ.Phillips:ContactLenses,5th edition,Butterworth-Heinemann,2006
4. ElisabethA.W.Millis:MedicalContactLensPractice,Butterworth-Heinemann,2004
5. ES.Bennett,VAHenry:ClinicalmanualofContactLenses,3rd edition, LippincottWilliams and Wilkins,2008

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

22. PEDIATRIC OPTOMETRY& GERIATRIC OPTOMETRY
COURSECODE: BOPT-022

Placement: IIIrdYear (VthSemester) **Time:**Theory:60Hours
Practical: 30Hours

Course Description: At the end of the course the student is expected to:

1. Have a knowledge of the principal theories of childhood development, and visual development
2. Have the ability to take a thorough paediatric history which encompasses the relevant developmental, visual, medical and educational issues
3. Be familiar with the accommodative-vergence system, the genesis of ametropia, the disorders of refraction,accommodation and vergence,and the assessment and management of these disorders
4. Be familiar with the aetiology,clinical presentation and treatment of amblyopia, comitant strabismus and commonly presenting in comitant strabismus

PEDIATRIC OPTOMETRY

UNIT-I (10 hrs)

- Introduction
- Review of ocular anatomy & Physiology
- Visual development—visual system, visual acuity, refractive error, contrast sensitivity function,eye movements, accommodation, binocular vision, color vision

UNIT-II (10 Hrs)

- Pediatric case history
- Genetic factors
- Prenatal factors
- Perinatal factors
- Postnatal factors

UNIT-III (10 Hrs)

- Normal appearance, pathology and structural anomalies of Orbit, Eyelids, lacrimal system, Conjunctiva, Cornea, sclera, Anterior chamber, uveal tract, pupils, lens, vitreous, retina, fundus, oculomotor system

GERIATRIC OPTOMETRY

UNIT-IV (15 Hrs)

- Structural and morphological changes of eye in elderly Physiological changes in eye in the course of aging.
- Introductiontogeriatricmedicine–epidemiology,needforoptometrycare,systemic diseases (Hypertension, Atherosclerosis, coronary heart disease, congestive Heart failure, Cerebro vascular disease, Diabetes, COPD)
- Optometric Examination of the Older Adult

UNIT-V (15 Hrs)

- Ocular diseases common in old age-cataract, glaucoma, macular disorders, vascular diseases of the eye
- Contact lenses in elderly
- Pharmacological aspects of aging
- Low vision causes, management and rehabilitation in geriatrics.
- Spectacledispensinginelderly–Considerationsofspectaclelensesandframes

RECOMMENDEDBOOKS

1. Principles &Practice of pediatric optometry AlfredRosenboom,M.W.Morgan
2. Pediatric Optometry Jerome Rosner
3. Clinical pediatric optometry Leonard.J.Press– 1stedition
4.Visual Development, Diagnosis,Treatment of the Pediatric Patients
RobertH Duckman

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

23. BINOCULAR VISION-I

COURSECODE:BOPT-023

Placement: IIIrdYear (VthSemester) **Time:**Theory:60Hours
Practical 30 Hours

UNIT-I (20 Hrs)

Binocular Vision and Spaceperception.

- Relative subjective visual direction.
- Retinomotor value
- Grades of BSV
- SMP and Cyclopean Eye

- Correspondence, Fusion, Diplopia, Retinalrivalry
- Horopter
- Physiological Diplopia and Suppression
- Stereopsis,Panum'sarea,BSV.
- Stereopsis and monocularclues-significance.

UNIT-II (20 Hrs)

Anatomy of Extra Ocular Muscles

- Recti and Oblique, LPS.
- Inner vation & Blood Supply.

Physiology of Ocular movements.

- Center of rotation, Axes of Fick.
- Action of individual muscle.

Laws of ocular motility

- Donder's and Listing's law
- Sherrington's law
- Herring's law

Uniocular & Binocular movements

- Fixation, saccadic & pursuits.
- Version & Vergence
- Fixation &field offixation

Near Vision Complex Accommodation

- Definition and mechanism (process).
- Methods of measurement.
- Stimulus and innervation.
- Types of accommodation.
- Anomalies of accommodation– Aetiology and management.

UNIT-III (20 Hrs)

Convergence & ARC

- Definition and mechanism.
- Methods of measurement.
- Types and components of convergence-Tonic, accommodative, fusional, proximal.
- Anomalies of Convergence– aetiology and management.
- Sensoryadaptations-Confusion,Suppression-InvestigationsManagement
- Abnormal Retinal Correspondence
  -Investigation and management

-Blind spot syndrome

- Eccentric Fixation-Investigation and management
- Amblyopia- Classification, Aetiology, Investigation Management

Text Books/Reference Books:

1. Pradeep Sharma:Strabismus simplified,NewDelhi,Firstedition,1999,Modernpublishers.
2. FionaJ.Rowe:ClinicalOrthoptics,secondedition,2004,BlackwellScienceLtd
   GunterK.V.Mosby Company
3. MitchellScheiman;BruceWick:ClinicalManagementofBinocularVisionHeterophoric,Accommodative,and Eye Movement Disorders, 2008,Lippincot Williams & Wilkins publishers

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

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24.LOW VISION AIDS

COURSE CODE:BOPT-024

Placement: IIIrdYear (VthSemester) **Time:Theory**:60Hours
Practical : 30 Hrs

Course Description: At the end of the course, the student will be knowledgeable in the following:

1. Definition and epidemiology of Low Vision
2. Clinical examination of Low vision subjects
3. Optical, Non-Optical, Electronic and Assistive devices.
4. Training for Low Vision subjects with Low vision devices
5. Referrals and follow-up
6. Be able to identify , investigate the age related changes in the eyes.
7. Be able to counsel the elderly

UNIT-I (10 Hrs)

LOW VISION

- Definitions & classification of Low vision
- Epidemiology of low vision
- Model of low vision service

UNIT-II (10 Hrs)

Pre-clinical evaluation of low vision patients –

- Prognostic & psychological factors; psycho-social impact of low vision,
- Types of low vision aids–optical aids, non-optical aids & electronic devices
- Optics of low vision aids

UNIT-III (15 Hrs)

- Clinical evaluation–assessment of visual acuity, visual field, selection of low vision aids, instruction & training
- Low vision aids–dispensing & prescribing a spects
- Visual rehabilitation & counseling
- Legal aspects of Low vision in India
- Case Analysis

UNIT-IV (15 Hrs)

- 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.

UNIT-V (10 Hrs)

- 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/ bold line note book/ illumination/ letter writer/ environmental modification/ signature guide/ needle threaded/ eccentric viewing strategies.

TEXTBOOKS/REFERENCEBOOKS:

1. Christine Dickinson: Low Vision: Principles and Practice Low vision care,
2. E Vaithilingam: Practice of Low vision–Aguide book, Medical Research Foundation,2000.
3. RichardL.Brilliant:Essentials of Low Vision Practice,Butterworth-Heinemann,1999
4. HelenFarral: Optometric Management of Visual Handicap,Black well Scientific publications, 1991
5. AJJackson,JSWolffsohn:LowVisionManual,ButterworthHeinnemann,2007

6. A.J.ROSSENBLOOMJr & M.W.MORGAN:Vision and Aging, Butterworth-Heinemann,Missouri,2007
7. OPSharma:GeriatricCare–A text book of geriatrics and Gerontology, viva books, NewDelhi,2005
8. VSNatarajan:AnupdateonGeriatrics,SakthiPathipagam,Chennai,1998
9. DE Rosenblatt,VS Natarajan:Primer ongeriatric Care A clinical approachtotheolder patient, Printers Castle, Cochin,2002

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

25. SYSTEMIC DISEASES

COURSE CODE: BOPT-025

Placement: IIIrdYear (VthSemester) **Time:**Theory:60Hours
Practical : 30 Hours

Course Description: At the end of the course, students should get acquainted with the following:

1. Common Systemic conditions :Definition ,diagnostic approach, complications and management options
2. Ocular findings of the systemic conditions
3. First Aid knowledge

UNIT-I (20 Hrs)

Hypertension

- Definition, Classification
- Epidemiology
- Clinical Examination
- Complications
- Management,
- Hypertensive Retinopathy

Diabetes Mellitus

- Classification
- Pathophysiology
- Clinical Presentations
- Diagnosis
- Management
- Complications
- Diabetic Retinopathy

Thyroid Disease

- Physiology
- Testing For Thyroid Disease
- Hyperthyroidism
- Hypothroidism
- Thyroiditis
- Thyroid Tumors
- Grave's Ophthalmopathy

Acquired Heart Disease

- Ischemic Heart Disease
- Congestive Heart Failure
- Disorders Of Cardiac Rhythm
- Ophthalmic Considerations

Cancer

- Incidence
- Etiology
- Therapy
- Ophthalmologic Considerations

UNITII (10 Hrs)

Connective Tissue Disease

- Rheumatic Arthritis
- Systemic Lupus Erythematosus
- Scleroderma

- Polymyositis And Dermatomyositis
- Sjogren Syndrome
- Behcet's Syndrome
- Eye And Connective Tissue Disease

UNIT-III (10Hrs)

Herpes virus (Herepessimplex, Varicella Zoster,Cytomegalo virus,EpsteinBarrVirus) - Herpes and the eye

Hepatitis (Hepatitis A,B,C), Acquired Immunodeficiency Syndrome Anemia

Diagnosis, Clinical evaluation consequences

Sickle cell disease - treatment Ophthalmologic considerations

UNIT-IV (10 Hrs)

Common Tropical Medical Ailments-Malaria,Typhoid,Dengue,Filariases, Onchocerciasis, Cysticercosis, Leprosy

Nutritional and Metabolic disorders -Obesity, Hyper lipidaemias

Kwashiorkor, Vitamin A,D,E,K,C,B1,B2Deficiency Myasthenia

Gravis First Aid

- General Medical Emergencies
- Preoperative precautions in ocular surgeries

UNIT-V (10 Hrs)

Genetics

- Introduction to genetics
- Organization of the cell
- Chromosome structure and cell division
- Gene structure and basic principles of Genetics
- Genetic disorders and their diagnosis
- Genes and the eye

TEXTBOOKS/REFERENCE BOOKS:

1. C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles andPracticeofMedicine,Ed.JohnMacleod,19thEd.,ELBS/ChurchillLivingstone.(PPM),2002
2. BasicandclinicalSciencecourse:UpdateonGeneralMedicine,AmericanAcademyof Ophthalmology, Section1,1999.

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

26. CLINICAL OPTOMETRY-PRACTICAL III

COURSE CODE: BOPT-026

Placement: IIIrdYear (VthSemester) **Time:Practical:**60Hours(Lab)

Clinical:180 Hours

PRACTICAL:

- History taking Paediatric subjects
- Assessment of visual acuity
  - -Normal appearance, pathology and structural anomalies of
  - -Orbit, Eyelids, Lacrimal system,
  - -Conjunctiva, Cornea, Sclera Anterior chamber, Uvealtract,Pupil
  - -Lens, vitreous, Fundus Oculomotor system
- Refractive Examination
- Determining binocular status
- Determining sensory motor adaptability
- Compensatorytreatmentandremedialtherapyfor:Myopia,Pseudomyopia,Hyperopia, Astigmatism, Anisometropia, Amblyopia
- Remedial and Compensatory treatment of Strabismus and Nystagmus
- Peadiatriceyedisorders:Cataract,RetinopathyofPrematurity,Retinoblastoma, Neuro muscular conditions (myotonic dystrophy, mitochondrial cytopathy),and Genetics
- Anterior segment dysgenesis, Aniridia, Microphthalmos, Coloboma,Albinism
- Spectacle dispensing for children
- Pediatric contact lenses
- Low vision assessment in children
- Attending low vision care clinic and history taking.
- Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.
- Inducing visual impairment and prescribing magnification.
- Determining reading speed with different types of low vision aids with same magnification.
- Determining reading speed with a low vision aid of different magnifications.

TEXTBOOKS/REFERENCEBOOKS:

1. Christine Dickinson: Low Vision: Principles and Practice Low vision care,
2. E Vaithilingam: Practice of Low vision–A guidebook, Medical ResearchFoundation,2000.
3. RichardL.Brilliant:EssentialsofLowVisionPractice,Butterworth-Heinemann,1999
4. Helen Farral: Optometric Management of Visual Handicap, Blackwell Scientific publications,1991
5. AJ Jackson, JSWolffsohn:Low Vision Manual,ButterworthHeinnemann,2007
6. A.J.ROSSENBLOOMJr & M.W.MORGAN: Vision and Aging, Butterworth- Heinemann,Missouri,2007

The practical examination will have the following components: (Time 3 hrs)

Practical Major	30 marks
Practical Minor/ Spotters	20 marks
Viva – Voce	25 marks
	75 marks
Practical Internal Assessment	25 marks
Total Marks	100 marks

BIOSTATISTICS & RESEARCH METHODOLOGY
Course Code: BAECT–C05

Placement: IIIrd Year (Vth Semester) **Time:** Theory: 30 Hours

Course Description:

At the end of the course, the students will be able understand of the statistical methods and apply Them in conducting research studies.

UNIT- I (5 Hrs)

Introduction:

- Concepts,types,significanceandscopeofstatistics,Meaningofdata,Sample,parameter
- Type and levels of data and their measurement
- Organizationandpresentationofdata–Tabulationofdata;Frequencydistribution–Graphicalandtabularpresentations

UNIT- II(5 Hrs)

Measures of central tendency:

- Mean, Median, Mode

Measures of variability:

- Range,Percentiles,averagedeviation,quartiledeviation,standarddeviation

Normal Distribution:

- Probability,
- Characteristics and application of normal probability curve;
- Sampling

UNIT- III (5 Hrs)

Measures of relationship:

- Correlation–need and meaning
- Rank order correlation
- Scatter diagram method
- Product moment correlation
- Simple linear regression analysis and prediction.

UNIT-IV (5 Hrs)

Significance of Statistic and Significance of difference between two statistics (Testinghypothesis)

- Non-parametric test – Chi-square test, Sign, median test, Mann Whitneytest.
- Parametrictest–'t'test, ANOVA, MANOVA,ANCOVA

UNIT- V (5 Hrs)

Research Methods:

- Research Meaning-
- Scope and Objectives
- .Research methods vs. Methodology.

Types of research

- Descriptive vs.Analytical
- Applied vs. Fundamental
- Quantitative vs. Qualitative
- Conceptual vs. Empirical

Concept of applied and basic research process

- Defining and formulating the research problem
- Selecting the problem, necessity of defining the problem,
- Importance of literature review in defining a problem,
- Criteria of good research.

Literature review

- Primary and secondary sources,
- Reviews, monograph, patents,
- Research databases, web as source, searching the web,
- Critical literature review,
- Identifyinggapareasfromliteratureandresearchdatabase,developmentofworkinghypothesis

UNIT- VI(5 Hrs)

Data Collection and Sampling:

- Data collection
- Classification of data
- Class intervals
- Continuous and discrete measurements
- Drawing frequency polygon
- Types of frequency polygon
- Histogram
- Accepts of method validation, observation and collection of data, methodsofdatacollection

Sampling methods, Data processing and analysis strategies and tools,data analysis with statistical package

- Sigma STAT, SPSS for studentt-test, ANOVA,etc.
- Hypothesis testing.

Correlation

- Historical contribution
- Meaning of correlation
- Types:Product,moment,contentcorrelation,variationofproduct,movementcorrelation,rankcorrelation,

Regression analysis.

- Tests of significance-need for
- sampling error
- significance of the mean
- significance of differences between means
- Interpretation of probability levels–small samples–largesamples.

Reference Books:

1. MahajanB.K.,Methods in Biostatistics for Medical Students and Research Workers,Jaypee,9th Edi,2018.
2. Sundar Rao& Richard, Introduction to Biostatistics &Research Methods, Prentice Hall of India, NewDelhi,5thedition,2012.
3. NegiK.S.,Biostatistics, A.I.I.B.S,1st Edi,2013.
4. Rao&Murthy, Applied Statistics in Health Sciences, J.B.Brothers,NewDelhi 2010.
5. Visweswara Rao, Biostatistics & Annual of Statistical Methods for use in Health,Nutrition and Anthropology, J.B.Brothers Publishers Pvt.Ltd.,2009.

27. CONTACT LENS - II

COURSE CODE:BOPT-027

Placement: IIIrdYear (VIth Semester) **Time:**Theory:60Hours
Practicals: 30 Hours

Course Description:

Upon completion of the course, the student should be able to:

1. Understand the basics of contact lenses
2. List the important properties of contact lenses
3. Finalise the CL design for various kinds patients
4. Recognize various types of fitting
5. Explain all the procedures to patient
6. Identify and manage the adverse effects of contact lens

UNIT-I (15 Hrs)

- SCL Materials & Review of manufacturing techniques
- Manufacturing of SoftToric CL
  -Stabilization techniques
  -Parameter selection
  -Fitting assessment
- RGP Contact Lens materials
- Manufacturing of Rigid Contact Lenses–various methods
- Comparison of RGPvs.SCL

UNIT-II (10 Hrs)

- Indications
- Fitting consideration
- Pre-Fitting examination–steps,significance,recordingofresults

UNIT-III (15 Hrs)

- Correction of Astigmatism with RGPlens
- Types of fit–Steep, Flat, Optimum–on spherical cornea with spherical lenses
- Types of fit–Steep, Flat, Optimum–on Tori cornea with spherical lenses
- Calculation and finalizing Contact lens parameters
- Ordering Rigid Contact Lenses–writing a prescription to the Laboratory
- Checking and verifying Contact lenses from Laboratory
- Modifications possible with Rigid lenses

UNIT-IV(10 Hrs)

- Common Handling Instructions-Insertion & Removal Techniques, Do's and Dont's
- Care and Maintenance of Rigid lenses
  -Cleaning agents & Importance
  -Rinsing agents & Importance
  -Disinfecting agents & importance
  -Lubricating & Enzymatic cleaners
- Follow up visit examination
- Complications of RGP lenses

UNIT-V (10 Hrs)

Specialty fitting

- Aphakia
- Peadiatric
- Post refractive surgery
- Introduction to Bifocal/Multi focalCL

TEXTBOOKS/REFERENCEBOOKS:

1. IACLEmodules1-10
2. CLAOVolumes1,2,3
3. AnthonyJ.Phillips:ContactLenses,5th edition,Butterworth-Heinemann,2006
4. ElisabethA.W.Millis: Medical Contact Lens Practice,Butterworth-Heinemann,2004
5. ES.Bennett, VAHenry: Clinical manual of Contact Lenses,3rd edition,Lippincott Williams and Wilkins, 2008

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

28. BINOCULAR VISION–II

COURSE CODE: BOPT-028

Placement: IIIrd Year (VIthSemester) **Time:**Theory:60Hours
Practical : 30 Hours

Course Description: The course is designed to inculcate the student with the knowledge of different types of strabismus its etiology signs and symptoms, necessary investigations and management. The student on completion of the course should be able to independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision. The student should be able to perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.

UNIT-I (10 Hrs)

- Neuro-muscular anomalies
- Classification and etiological factors
- History–recording and significance.

UNIT-II (10 Hrs)

Convergent strabismus

- AccommodativeconvergentsquintClassification,InvestigationandManagement
- NonaccommodativeConvergentsquintClassification,InvestigationandManagement
- Divergent Strabismus–Classification, Investigation and Management
  -A&V phenomenon

UNIT-III (10 Hrs)

Vertical strabismus

- Classification
- Investigation and
- Management

UNIT-IV (15 Hrs)

Paralytic Strabismus

- Acquired and Congenital
- Distinction from comitant and restrictive Squint
- Investigations
- History and symptoms
- Head Posture
- Diplopia Charting
- Hess chart
- PBCT
- Nine directions
- Binocular field of vision
- Non-surgical Management of Squint

UNIT-V (15 Hrs)

Restrictive Strabismus

Clinical features and management of

- Musculofascical anomalies
- Duane's Retraction syndrome
- Brown's Superior obliquesheath syndrome
- Strabismusfixus
- Congenital muscle fibrosis

TEXTBOOKS/REFERENCEBOOKS:

1. Pradeep Sharma: Strabismus simplified,New Delhi, First edition,1999,Modernpublishers.
2. FionaJ.Rowe:Clinical Orthoptics,second edition,2004,Blackwell Science Ltd
3. GunterK.VonNoorden:BURIAN-VONNOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition,1980,C.V. Mos by Company
4. Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative and Eye Movement Disorders,2008,LippincotWilliams&Wilkinspublishers

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
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	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

29. PUBLIC HEALTH & COMMUNITY OPTOMETRY
COURSE CODE: BOPT- 029

Placement: III Year (VI Semester) **Time:**Theory:60 Hours
Practical: 30 Hours

Course Description: At the end of the course the students will be knowledgeable in the following aspects:

1. In visual requirements of jobs;
2. In effects of physical, chemical and other hazards on eye and vision;
3. To identify occupational causes of visual and eye problems;
4. To be able to prescribe suitable corrective lenses and eye protective wear
5. To set visual requirements, standards for different jobs.
6. Community based eye care in India.
7. Prevalence of various eye diseases
8. Developing Information Education Communication materials on eye and vision are for the benefit of the public
9. Organize health education programmes in the community
10. Visionscreeningforvariouseyediseasesinthecommunityandfordifferentagegroups

PUBLIC HEALTH

UNIT-I (15 Hrs)

- Public Health Optometry: Concepts and implementation, Stages of diseases
- Dimensions, determinants and indicators of health
- Levels of disease prevention and levels of healthcare patterns
- Epidemiology of blindness–Defining blindness and visual impairment
- Eye in primary healthcare
- Contrasting between Clinical and community health programs
- Community Eye Care & rehabilitation programs
- Programs
- Nutritional Blindness with reference to Vitamin A deficiency

OCCUPATIONAL OPTOMETRY

UNIT-II (10 Hrs)

- Introduction to Occupational health, hygiene and safety
- International bodies like ILO,WHO, National bodies etc,
- Acts and Rules-Factories Act,WCA,ESI Act.

UNIT-III (10 Hrs)

- Light–Definitions andunits, Sources, advantages and disadvantages, standards
- Color–Definition,Colortheory,Colorcoding,Colordefects,ColorVisiontests
- Electromagnetic Radiation and its effects on Eye
- Occupational hazards and preventive/protective methods
- Task Analysis
- Industrial Vision Screening

UNIT-IV (10 Hrs)

- Modified clinical method and Industrial Vision test
- Vision Standards–Railways, Roadways, Airlines
- Visual Display Units
- Contact lens and work
- Vision2020:The Right to Sight

- Screening for eye diseases
- National and International health agencies, NPCB

COMMUNITYOPTOMETRY

UNIT-V (15 Hrs)

- Organization and Management of Eye Care Programs–Service Delivery models
- Health manpower and planning &Health Economics
- Evaluation and assessment of health programmes
- Optometrists role in school eye health programmes
- Basics of Tele Optometry and its application in Public Health
- Information, Education and Communication for EyeCare programs

TEXTBOOKS/REFERENCE BOOKS:

1. RVNorth: Work and the eye, Second edition,ButterworthHeinnemann,2001:
2. GWGood: Occupational Vision Manual available in the following website:www.aoa.org
3. N.A.Smith: Lighting for Occupational Optometry, HHSCH and book Series, Safchem Services, 1999
4. GCarson, SDoshi,WHarvey:Eye Essentials
5. GVSMurthy, SKGupta, D Bachani: The principles and practice of community Ophthalmology,National programme for control of blindness,NewDelhi,2002
6. Newcomb RD,JolleyJL: Public Health and Community Optometry, CharlesC Thomas Publisher, Illinois,1980
7. Newcomb RD, JolleyJL:Public Health and Community Optometry, CharlesC Thomas Publisher, Illinois,1980

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	---	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

30. OCCUPATIONAL OPTOMETRY-THEORY
COURSE CODE: BOPT-030

Placement: IIIYear (VISemester) **Time:** Theory: 60Hours
Practical: 30 Hours

OCCUPATIONAL OPTOMETRY

1. Introduction to occupational health, hygiene and safety International Bodies like ILO,WHO, National bodies like labour Institutes, National Institutes of Occupational Health, National Safety Council, etc.
2. Acts and Rules: Factories Act and Rules-Workmen's Compensation Act–ESIAct, etc
3. Occupational diseases / occupation related diseases caused by–physical agents, chemical agents and biological agents
4. Occupational hygiene, environmental monitoring
   - Recognition, evaluation and control of hazards
   - Illumination–definition, measurements and standards
5. Occupational safety
   - Causes of accidents
   - Vision, lighting, colour and their role
   - Accident analysis
   - Accident prevention
6. Ocular and visual problems of occupation
   - Electromagnetic radiation
   - Ionizing
   - Non-ionizing–Infrared
   - Ultraviolet
   - Microwave, Laser
   - Injuries–Mechanical, chemical
   - Toxicology–Metals, chemicals
7. Prevention of occupational diseases
   - Medical examination/medical monitoring
   - Pre-employment/pre-placement
   - Periodic
8. Personal protective equipment
   - General
   - Goggles, face shields, etc
   - Selection and use
   - Testing for standards
9. Standards
   - Visual standards for jobs
10. Problems of special occupational groups
    - Drivers ,Pilots and others
11. Field work–submission o freports
    - Visits to: Regional Labour Institute, selected industries

12. Visual display units (terminals)--VDU/VDT

- Contact lens and work
- Pesticides–general and visual and ocular defects

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

Reference Books:

1. R.A.F.Cox (ed.)fitness for work –the medical aspects. Oxford University Press2000, reprinted 2003
2. Indian Association of Occupation Health, Guidelines on Pre-Employment Medical Examination, Pune 19983. BarbaraA.Plog,PatricaJ. Quinlan. Fundamentals of Industrial Hygiene.5th Edition,2002
4. John Ridley &John Channing. Safety at work.5th Edition1999,reprinted 2000,2001
5. Stephen Konz, Steven Johnson.WorkDesign-IndustrialErgonomics2000
6. Salvatore R. Dinardi.The Occupational Environment–Its Evaluation and Control1997
7. Linda Rosenstock & Mark R.Cullen. Text book of Clinical Occupational and Environmental Medicine, 1994
8. William N.Rom. Environmental and Occupational Medicine. 3rdedition, 1998
9. StephenL.Demeter,GunnarB.J.Andersson.DisabilityEvaluation.2ndedition,2003

Examination Pattern

Subject		**Duration**
Theory exam:	75 marks	3 hours
Internal assessment (Theory)	25 marks	
	100 marks	

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	- 2 X 10 = 20 marks
Short answer question	- 7 X 5 = 35 marks
Very Short answer	- 10 X 2 = 20 marks

30. CLINICAL OPTOMETRY PRACTICAL-IV
COURSECODE:BOPT-030

Placement: III Year (VI Semester) **Time:**Practical/Clinical:220Hours

The course provides students the opportunity to continue to develop confidence and increased skill in diagnosis and treatment delivery. Students will demonstrate competence in basic, intermediate and advance procedure in those areas. Students will participate in advance and specialized diagnostic and management procedure. Students will get practical experience of the knowledge acquired from geriatric and paediatric optometry courses. Hands-on experience under supervision will be provided in various outreach programmes namely, school vision screening, glaucoma and diabetic retinopathy screening etc., Students also get hand-on practical sessions on the following courses namely, contact lens, low vision care, geriatric optometry and paediatric optometry.

PRACTICAL:

- Extra ocular motility
- Cover test & Alternate cover test
- Pupil examination
- Maddox rod
- Slit lamp examination
- Schirmer test
- Colour vision test
- Contact lens insertion and removal
- Fitting assessment
- IOP assessement with Schiotz tonometer
- Special contact lens.
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TEXTBOOKS/ REFERENCEBOOKS:

1. A K Khurana: Comprehensive Ophthalmology,4th edition, New age international(p)Ltd. Publishers, New Delhi, 2007.

2.A K Khurana: Theory & Practice of optics and Refraction 4th edition, New age

MEDICAL LAW, ETHICS & PRACTICE MANAGEMENT

COURSE CODE: C06

Placement: III[rd] Year (VI[th]Semester) **Time:**Theory:30Hours

Course Description: The goal of the course is to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice.

MEDICALLAW & ETHICS

- Medical ethics-Definition-Goal-Scope
- Introduction to Code of conduct

UNITI

- Basic principles of medical ethics–Confidentiality
- Malpractice and negligence-Rational and irrational drug therapy Autonomy and informed consent-Right of patients
- Care of the terminally ill-Euthanasia
- Organ transplantation

UNITII

- Medico legal aspects of medical records–Medico legal case and type-Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - Obtaining an informed consent-other various aspects.
- Professional Indemnity insurance policy
- Development of standardized protocol to avoid near missorsentinel events

PRACTICEMANAGEMENT

UNITIII

- BusinessManagement:Practiceestablishmentanddevelopment,Stockcontrolandcosting
- Staffing and staff relations
- Business computerization
- Accounting Principles-Sources of finance, Book keeping and cash flow
- Taxation and taxation planning

UNITIV

Professionalism and Values

- Professional values
- Integrity, Objectivity, Professional competence and due care, Confidentiality
- Personal values-ethical or moral values
- Attitude and behavior –professional behaviour, treating people equally
- Code of conduct, professional accountability and responsibility, misconduct
- Differences between professions and importance of team efforts
- Cultural issues in the health care environment

TEXTBOOKS/REFERENCE BOOKS:

1. K Park: Park'sText Book of Preventive and Social Medicine, 19[th]edition, Banarsidas Bhanot publishers, Jabalpur,2007
2. MC Gupta, Mahajan BK, Murthy GVS, 3[rd]edition. Text Book of Community Medicine, Jaypee Brothers, NewDelhi,2002

VIII. Question Paper Pattern

(Subject with Theory and Practical Exam)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Time: 3 hours Max Marks: 80

Pattern of Question Paper

I. Write essay on **any TWO** (2x 10 =20 marks)

1.
2.
3.

II. Write short notes on **any EIGHT**(8 x 5 =40 marks)

4.
5.
6.
7.
8.
9.
10.
11.
12.
13.

III. Very Short Answer – Answer **all questions**: (10 x 2 = 20 marks)

14.
15.
16.
17.
18.
19.
20.
21.
22.
23.

VIII. Question Paper Pattern

(Subject with only Theory Exam and no Practical Exam)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Time: 3 hours Max Marks: 75

Pattern of Question Paper

I. Write essay on **any TWO** (2x 10 =20 marks)

1.
2.
3.

II. Write short notes on **any SEVEN** (7 x 5 =35 marks)

4.
5.
6.
7.
8.
9.
10.
11.
12.

III. Very Short Answer – Answer **all questions**: (10 x 2 = 20 marks)

13.
14.
15
16.
17.
18.
19.
20.
21.
22.