ROYAL GLOBAL UNIVERSITY
GUWAHATI

(ROYAL SCHOOL OF MEDICAL & ALLIED SCIENCES)

(RSMAS)

DEPARTMENT OF OPTOMETRY

Learning Outcomes-based Curriculum

Framework (LOCF) for

Undergraduate Program in B. Optometry

W.E.F 2022-23

Table of Contents

1. PREAMBLE

The following aspects have been taken into cognizance by faculty members and members of Board of Studies while framing the B. Optometry syllabus:

i. The learning outcomes of the B. Optomtery programme are designed to help students analyze, appreciate, and critically engage in assessment, evaluation, planning, and inventions in achieving the eye care needs of Indian society.

ii. It is significant to note that the B. Optometry syllabus is the point of reference for the LOCF recommendations. It focuses on student centric pedagogy, interdisciplinarity, inclusive education, and equitable use of technology and maintaining collaborative relationships with members of other disciplines to improve health care. To this end, the texts mentioned in this document are indicative. The organization of divisions/themes/genres/periods/areas, etc. is specific to the contexts identified in the course.

iii. The arrangement of courses/papers in the semesters is in accordance with the credit load in each semester and the overall credit. Of course, the selection of subjects and topics is made to ensure preliminary understanding of the subject and to retain courses in the second and third year that require greater attention and specialization. Courses are incorporated keeping in view that the students will develop a deep understanding of the interaction between ocular health, systemic health, mental health, and social health.

iv. The overarching concern of the LOCF framework is to have definite and justifiable outcomes, including and their realization by the end of the programme. This also includes enhancing students' personalities, preparing students for the job market—including clinical, retail, publishing, academic and corporate sectors.

1.1 INTRODUCTION

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

Optometrist also means a person having-

i. Graduate degree in optometry obtained after the completion of a full time course of 4 years(baccalaureate) which includes supervised clinical training from any university recognized by the University Grants Commission established under the University Grants Commission Act 1956; or
ii. Post graduate degree in optometry after completion of a full time course of two years and /or PhD in the same.
iii. Diploma in ophthalmic techniques/ Diploma in optometry will be considered as entry level until 2020. The program will be phased out and the diploma will be encouraged to upgrade to degree through lateral entry courses. After this period they will not be designated as Optometrist.

The Optometry curriculum aims to focus on skills and competencies based approach for learning and are designed accordingly. The curriculum is prescriptive and is designed with an aim to standardize the content across the nation. As stated above the focus of the profession is to create qualified and skill manpower in the field of Optometry through the following levels of higher education –

1. Bachelor of Optometry (B. Optom)
2. Master of Optometry (M. Optom)
3. PhD

1.2 GRADUATE ATTRIBUTES:

GA 1. Disciplinary Knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

GA 2. Communication Skills: Ability to express thoughts and ideas effectively in writing and orally, communicate with others using appropriate media, confidently share one‟s views and express herself/himself, demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

GA 3. Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

GA 4. Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one‟s learning to real life situations.

GA 5. Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyse and synthesise data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

GA 6. Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.

GA 7. Cooperation/Team work: Ability to work effectively and respectfully with diverse teams, facilitate cooperative or coordinated effort on the part of a group and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

GA 8. Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

GA 9. Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. Self-directed learning:Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

GA 10. Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

GA 11. Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

GA 12. Lifelong learning: Ability to acquire knowledge and skills, including „learning how to learn‟, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/ re-skilling.

1.3 PROGRAM LEARNING OUTCOME:

PO1.Disciplinary Knowledge: Ability to attain detailed knowledge and understanding of the origin and development of Optometry. Be able to develop skills to provide comprehensive eye examination

a. To acquire knowledge on ocular structures, its functions and pathological changes

b. To carryout ophthalmic investigations

c. To impart knowledge with regard to common eye diseases

d. To impart knowledge on treatment modalities from the perspective of counselling

e. To acquire knowledge about the referral guidelines for ocular and systemic conditions

PO2.Communication Skills : Ability to develop a good communication skill, building a successful patient practitioner relationship thus increasing cooperation between team members responsible for patient's well being.

PO3.**Critical Thinking:** Ability to substantiate critical cases while handling a patient with ocular complaints.

PO4.Problem Solving: Ability of being skilled at evaluating, analyzing and solving the patient's ocular problems

PO5.**Analytical Reasoning:** Ability to analyze and interpret diagnosis of visual defects & impairments of various ocular conditions/pathologies – Refractive error, Strabismus, Cataract, Diabetic retinopathy, Glaucoma etc..

PO6.Research-Related Skills: Ability to identify research gaps, formulate research questions and ascertain relevant sources to find substantive explanations

PO7.Teamwork and Time Management: Ability to participate, contribute and provide constructive criticism while handling patient in a clinic/hospital.

PO8.**Scientific reasoning** : Ability to judge professionally thus allowing for optometry practitioners to be use evidence based practice and provide quality patient care.

PO9.Information/digital literacy: Ability to use digital sources for personal research, carry out presentations , postulate questions and search for answers.

PO10.Multicultural competence: Enabling eye care professionals to respond to demographic changes and eliminate health disparities thus allowing them to improve the quality of services and health outcomes, meeting legislative regulatory and accreditation mandates, gain a competitive edge in marketplace.

PO11.Leadership readiness/qualities: Ability of developing personal qualities and and creating a proper workspace by working with others; ability to lead group discussions.

PO12.Lifelong learning: Ability to interrogate one's own ethical values and to be aware of ethical issues; keeping up with emerging research and innovative new technologies outside the workspace.

1.4 PROGRAM SPECIFIC OUTCOME:

At the completion of this course, the student should -

PSO1. Be able to develop skills to provide comprehensive eye examination by correcting refractive error, provide spectacle prescription, to fit & dispense contact lenses and evaluate other ocular conditions along with performing pre & post operative workup.

PSO2. Be able to assess the low vision by providing comprehensive low vision care and also to develop adequate knowledge of manufacturing skills of spectacles, contact lenses & low vision devices

PSO3. Have detailed knowledge regarding organizations of eye banks i.e. preservation of ocular tissues., counselling on visual/ocular hygiene, nutritional and environmental modifications.

PSO4. Be able to do complete binocular vision assessment, manage non-strabismic binocular vision anomalies and refer condition which warrants surgery, have knowledge of counselling on visual/ocular hygiene, nutritional and environmental modifications

1.5 ASSESSMENT METHODS

	Component of Evaluation	Marks	Frequency	Code	Weightage (%)
A	**Continuous Evaluation**				
i	Analysis/Class test	Combination of any three from (i) to (v) with 5 marks each	1-3	C	25%
ii	Home Assignment		1-3	H	
iii	Project		1	P	
iv	Seminar		1-2	S	
v	Viva-Voce/Presentation		1-2	V	
vi	MSE	MSE shall be of 10 marks	1-3	Q/CT	
vii	Attendance	Attendance shall be of 5 marks	100%	A	5%
B	Semester End Examination		1	SEE	70%
	Project				**100%**

BACHELOR OF OPTOMETRY

BACHELOR DEGREE IN OPTOMETRY

PROGRAMME STRUCTURE

1ST SEMESTER							
SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C101	GEOMETRICAL OPTICS + GEOMETRICAL OPTICS LAB	**3**	**0**	**2**	**4**	**5**
2	OPT242C102	GENERAL PHYSIOLOGY	**3**	**1**	**0**	**4**	**4**
3	OPT242C103	GENERAL ANATOMY + GENERAL ANATOMY LAB	**2**	**1**	**2**	**4**	**5**
SKILL ENHANCEMENT COURSE (SEC) (ANY ONE)							
4	OPT242S111	GENERAL PHYSIOLOGY LAB	**0**	**0**	**4**	**2**	**2**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
5	CEN982A101	COMMUNICATIVE ENGLISH-I	**1**	**0**	**0**	**1**	**1**
6	BHS982A104	BEHAVIOURAL SCIENCE-I	**1**	**0**	**0**	**1**	**1**
VALUE ADDED COURSE (VAC)							
7		Will select one course from a basket of courses (2)	**2**	**0**	**0**	**2**	**2**
GENERIC ELECTIVE							
8	OPT242G101	GE-1 (BIOCHEMISTRY)	**3**	**0**	**0**	**3**	**3**
9	OPT242G102	GE -2	**3**	**0**	**0**	**3**	**3**
		TOTAL				**24**	
2ND SEMESTER							
SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**

CORE SUBJECTS							
1	OPT242C201	PHYSICAL OPTICS + PHYSICAL OPTICS LAB	**3**	**0**	**2**	**4**	**5**
2	OPT242C202	OCULAR PHYSIOLOGY	**3**	**1**	**0**	**4**	**4**
3	OPT242C203	OCULAR ANATOMY	**3**	**1**	**0**	**4**	**4**
SKILL ENHANCEMENT COURSE (SEC)(ANY ONE)							
4	OPT242S211	OCULAR ANATOMY LAB	**0**	**0**	**4**	**2**	**4**
VALUE ADDED COURSE(VAC)							
5		Will select one course from a basket of courses (2)	**2**	**0**	**0**	**2**	**2**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
6	CEN982A201	COMMUNICATIVE ENGLISH-II	**1**	**0**	**0**	**1**	**1**
7	BHS982A204	BEHAVIOURAL SCIENCE-II	**1**	**0**	**0**	**1**	**1**
GENERIC ELECTIVE							
8	OPT242G201	GE-1 (COMPUTER FUNDAMENTALS & PROGRAMMING + COMPUTER LAB)	**3**	**0**	**0**	**3**	**3**
9	OPT242G202	GE- 2	**3**	**0**	**0**	**3**	**3**
		TOTAL				**24**	

3RD SEMESTER

SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							

1	OPT242C301	VISUAL OPTICS-I	**3**	**1**	**0**	**4**	**4**
2	OPT242C302	OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE + OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE LAB	**3**	**1**	**2**	**4**	**5**
DISCIPLINE SPECIFIC ELECTIVE(DSE) (ANY ONE)							
3	OPT242D301	MEDICAL PATHOLOGY & MICROBIOLOGY	**3**	**1**	**0**	**4**	**4**
4	OPT242D302	MEDICAL PSYCHOLOGY	**3**	**1**	**0**	**4**	**4**
GENERIC ELECTIVE							
5	OPT242G301	GE-1 (PHARMACOLOGY)	**3**	**0**	**0**	**3**	**3**
6	OPT242G302	GE-2	**3**	**0**	**0**	**3**	**3**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
7	EVS982A303	ENVIRONMENTAL SCIENCE	1	0	0	1	1
8	CEN982A301	COMMUNICATIVE ENGLISH-III	1	0	0	1	1
INTERNSHIP							
		INTERNSHIP	0	0	8	4	4
		TOTAL				**24**	
4TH SEMESTER							
SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C401	OCULAR DISEASE I	**3**	**1**	**0**	**4**	**4**
2	OPT242C402	OPHTHALMIC LENS & DISPENSING OPTICS	**3**	**1**	**0**	**4**	**4**
DISCIPLINE SPECIFIC ELECTIVE (DSE)(ANY ONE)							
3	OPT242D401	CLINICAL REFRACTION I + CLINICAL REFRACTION LAB	**3**	**0**	**2**	**4**	**5**
4	OPT242D402	CLINICAL EXAMINATION OF THE VISUAL SYSTEM	**3**	**1**	**0**	**4**	**4**

SKILL ENHANCEMENT COURSE (SEC)							
5	OPT242S411	OPHTHALMIC LENS & DISPENSING OPTICS LAB	**0**	**0**	**4**	**2**	**4**
VALUE ADDED COURSE (VAC)							
6		Will select one course from a basket of courses (2)	**2**	**0**	**0**	**2**	**2**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
7	CEN982A401	COMMUNICATIVE ENGLISH-IV	1	0	0	1	1
8		BEHAVIOURAL SCIENCE-IV	1	0	0	1	1
GENERIC ELECTIVE							
8	OPT242C401	VISUAL OPTICS- II	**3**	**0**	**0**	**3**	**3**
9	OPT242G401	GE-2	**3**	**0**	**0**	**3**	**3**
		TOTAL				**24**	

5TH SEMESTER							
SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C501	BINOCULAR VISION & OCULAR MOTILITY	**4**	**0**	**0**	**4**	**4**
2	OPT242C502/ OPT242C511	CONTACT LENS I + CONTACT LENS LAB	**3**	**0**	**2**	**4**	**5**
DISCIPLINE SPECIFIC-DSE (ANY TWO)							
3	OPT242D501/ OPT242D511	LOW VISION AIDS AND VISUAL REHABILITATION + LAB	**3**	**0**	**2**	**4**	**5**
4	OPT242D502	OCULAR DISEASE II	**4**	**0**	**0**	**4**	**4**
	OPT242C513	GERIATRIC OPTOMETRY	**3**	**0**	**2**	**4**	**5**

VALUE ADDED COURSE (VAC)							
5		Will select one course from a basket of courses	**2**	**0**	**0**	**2**	**2**
ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)							
6	CEN982A501	COMMUNICATIVE ENGLISH-V	1	0	0	1	1
7							
INTERNSHIIP							
6	OPT242S511	INTERNSHIP	0	0	12	6	12
		TOTAL				**28**	

6TH SEMESTER

SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C601/ OPT242C611	APPLIED OPTOMETRY & ORTHOPTICS + LAB	**3**	**0**	**2**	**4**	**5**
2	OPT242C602/ OPT242C612	CONTACT LENS-II + LAB	**3**	**0**	**2**	**4**	**5**
DISCIPLINE SPECIFIC-DSE (ANY THREE)							
3	OPT242D601	SYSTEMIC CONDITION AND THE EYE	**4**	**0**	**0**	**4**	**4**
4	OPT242D602	PUBLIC HEALTH AND COMMUNITY OPTOMETRY	**4**	**0**	**0**	**4**	**4**
5	OPT242D603	BIOSTATISTICS	**4**	**0**	**0**	**4**	**4**
6	OPT242D604	OCCUPATIONAL OPTOMETRY & LAW AND OPTOMETRY	**4**	**0**	**0**	**4**	**4**
SKILL ENHANCEMENT COURSE (SEC)							
7	OPT242S601	INDIAN TELEMEDICINE	**2**	**0**	**0**	**2**	**2**
VALUE ADDED COURSE (VAC)							
8		Will select one from a basket of courses	**2**	**0**	**0**	**2**	**2**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
9	CEN982A601	COMMUNICATIVE ENGLISH-VI	**1**	**0**	**0**	**1**	**1**

10		ENVIRONMENTAL STUDIES & SUSTAINABLE DEVELOPMENT II	**1**	**0**	**0**	**1**	**1**
		TOTAL				**26**	

7TH SEMESTER

SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C721	INTERNSHIP	**0**	**0**	**24**	**12**	**24**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
ABILITY ENHANCEMENT ELECTIVE COURSES (AEEC)							
DISCIPLINE SPECIFIC-DSE (ANY TWO)							
		TOTAL				**12**	

8TH SEMESTER

SL.NO.	**SUBJECT CODE**	**NAMES OF SUBJECTS**	**L**	**T**	**P**	**C**	**TCP**
CORE SUBJECTS							
1	OPT242C821	Internship	**0**	**0**	**10**	**10**	**10**
ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)							
ABILITY ENHANCEMENT ELECTIVE COURSES (AEEC)							
DISCIPLINE SPECIFIC-DSE (ANY TWO)							
		TOTAL				**10**	

SYLLABUS (1ST SEM)

CORE PAPER I /SUBJECT NAME: GEOMETRICAL OPTICS + GEOMETRICAL OPTICS LAB
SUBJECT CODE: OPT242C101
SCHEME OF EVALUATION: (T + P) **L-T-P-C:3-0-2-4**
Total credits: 4

Course Objective: The objective of the subject is to give attention to the system of surfaces and/or lenses and their imaging properties, the effect of aperture stops on the quality of images, such as blur and aberrations, depth of field and depth of focus. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be studied in this course.

Course outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Equip the students with a thorough **knowledge** of light and its behavior, properties of plane, spherical, cylindrical and toric lenses, and mirrors.	**BT 1**
CO 2	**Describe** the image formation by mirrors and lenses using ray diagrams.	**BT 2**
CO3	**Apply** the laws of reflection and refraction to solve problems involving the path of light in different media.	**BT 3**
CO4	**Analyse** the basic properties of the images formed on the retina by the optics of the eye.	**BT 4**

SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	What is light- dual nature- particle & wave nature, speed, wave length & frequency of light. Fermats' principle- laws of relation & refraction at a plane surface using Fermats' principle	**9**
2	Snells' law, relative and absolute refractive indices, total internal reflection and Critical angle, refraction by plane parallel slab of glass;molecular basis of reflectively (basic index).	**9**
3	Geometrical path length & optical path length of rays, Concept of wave fronts & rays, concept of Vergence divergence , convergence. Refraction by spherical surfaces- convex & concave, Derivation of vergence equation, focal points, deportee power, image point, lateral & axial magnification, simple numerical. Thin Lens- shapes, derivation of lens makers' formula, thin lens vergece equation, equivalent focal length of two thin lenses separated by a distance & placed in contact, lateral magnification of thin lenses in contact, simple numerical, concept of reduced systems.	**9**
4	Thick Lens- Cardinal points & planes, front & back vertex power, matrix theory in paraxial Optics to locate positions of cardinal planes. Different types of aberrations & their effects. Prism- Dispersion of prism, reflecting prisms , prisms diopters. Geometrical theory of optical fibers. Uses of optical filers	**9**
	TOTAL	**36**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Determination of the focal length & hence the power of a convex lens by displacement method..	**3**
2	Determination of the refractive index of a transparent liquid by using a travelling microscope. Determination of the refractive index of the material of a convex lens measuring its focal length, using the lens & a plane mirror.	**3**
3	Determination of the focal length of a concave mirror by graphical method.	**3**
4	Determination of refractive index of the material of a prism by minimum deviation method. To draw curve of a prism by a spectrometer & hence to find out the angle of minimum deviation.	**3**
	TOTAL	**12**

Textbook:

1. Tunnacliffe A. H, Hirst J. G, Optics, The association of British Dispensing Opticians, London, U.K., 1990.

2. Pedrotti L. S, Pedrotti Sr. F. L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.

SYLLABUS (1ST SEM)

CORE PAPER II /SUBJECT NAME: GENERAL PHYSIOLOGY

SUBJECT CODE: OPT242C102

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

Objective of this subject is to deal with the entire human anatomy with emphasis on different organ systems, their physiological functions with special emphasis on blood and neuro physiology.

Course Outcome : At the end of the course the student will be able to:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Explain the normal functioning of various organ systems of the body, their interactions & **understand** the physiological aspects of normal growth and development.	**BT 1**
CO 2	**Apply** knowledge of physiology to explain normal and abnormal functioning of different organ systems.	**BT 2**
CO 3	**Apply** knowledge of physiology to explain normal and abnormal functioning of different organ systems.	**BT 3**
CO 4	Understand the physiological response and adaptations to environmental stresses & **correlate** the physiological principles underlying pathogenesis of disease.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Basic Biological (Biophysical & Biochemical) Principles: Diffusion, surface tension and viscosity – their characteristics, factors influencing and biological applications. Osmosis – osmometers, laws of osmosis, biological applications, relation with depression of freezing points. Acids, bases and pH. Colloids – classification, properties – optical and electrokinetic, biological importance of colloids. Dialysis and ultra-filtration. Chromatography: Principles & applications, Electrophoresis: Principles & applications, Gel electrophoresis. Ultracentrifugation: moving boundary and density gradient ultracentrifugation. Adsorption. Gibbs-Donnan equilibrium. Radioactivity – radioisotopes and their biological applications. Principles of radioimmunoassay (RIA), autoradiography. The resting membrane potential. The action potential. Electrotonic potentials. Propagation of nerve impulse in different types of nerve fibers. Compound action potentials.	**12**
2	2. Genetics: Nucleic acid- 1. Structure of DNA- Physical & Chemical properties of DNA & RNA, Ultra structure & types of DNA & RNA(in details), Brief idea about super coiling of DNA Semiconservative mode of replication of DNA, Mechanism of replication of DNA, ,Genetic code. Genetically relation of color blindness and ocular albinism. Chromosome aberration- Structural aberration- Deletion- Duplication- Inversion- translocation. Numerical aberration (Polyploidy & aneuploidy- Hyper & hypo). Gene mutation- classification-spontaneous & Induced- Chemical mutation- Practical Application of mutation.	**12**

3	3. Blood Vascular system Composition and functions of blood. Plasma proteins – normal values, origin and functions. Brief idea on Bone marrow. Formed elements of blood – origin, formation, functions and fate. Hemoglobin – functions, compounds and derivatives. Abnormal hemoglobin-overview. Thalassemia-brief idea. Different types of anemia and their causes-overview. Erythrocyte sedimentation rate (ESR) and its significance. Hematocrit. PCV, MCV, MCH, MCHC. Blood volume – normal values, regulation. Blood coagulation – factors, process, anticoagulants, Prothrombin time. Clotting time. Bleeding time. Blood groups – ABO systems and Rh factors. Blood transfusion. Ultra structure & functions of blood vessels (artery & vein). Structure type and function of capillaries. Differences between artery & vein. 4. Muscular Physiology: Microscopic and electron microscopic structure of skeletal, smooth and cardiac muscles. Difference between skeletal, smooth and cardiac muscles. The sarcotubular system. Red and white striated muscle fibers. Single unit and multi unit smooth muscle. Motor point. Properties of muscle: excitability and contractility, all or none law, summation of stimuli, summation of contractions, effects of repeated stimuli, genesis of tetanus, onset of fatigue, refractory period, tonicity, conductivity, extensibility and elasticity. Electromyography. Muscle contraction – E C Coupling, Muscle fatigue, Rigor mortis, Sliding filament theory, Slow & fast muscle fibers, Isotonic & Isometric contraction. 5. Neuro Physiology Electron microscopic structure of nerve cell or neurons. Neuroglia. Myelinated and unmyelinated nerve fibers. Conduction velocity of nerve impulse in relation to myelination and diameter of nerve fibers. Properties of nerve fibers – excitability, conductivity, all-or-none law, accommodation, adaptation, summation, refractory period, indefatiguability. Concept of chronaxie and rheobase. Synapses – types, structure, synaptic transmission of the impulse, synaptic potentials, neurotransmitters. Motor unit. Injury to peripheral nerves – degeneration and regeneration-brief idea. Automatic nervous system – Introduction, Comparison of autonomic & somatic nervous system, Anatomy of autonomic motor pathways – Pre-ganglionic neurons, autonomic ganglia, sympathetic ganglia, autonomic plexus, post-ganglionic neurons structure of sympathetic and parasympathetic division. ANS- neurotransmitter and receptors- cholinergic neurons & receptors. Receptor agonist & antagonist. Physiological effect of ANSsympathetic & parasympathetic response. Integration & control of autonomic function- autonomic Reflexes, autonomic control by higher centers. Neural Transmission- Introduction, Autonomic Synaptic Transmission- Modes of transmission, sympathetic &	**12**

	parasympathetic response. CNS Synaptic transmission-Electrical synaptic transmission & chemical synaptic transmission. Neuro muscular Junction – The neuromuscular junctions – structure, events in transmission, end-plate potential, post tetanic potential.	

4	6.Cardio Vascular System – Structure & function of Heart & blood vessels (artery, vein and capillary) (Anatomical position, chambers of heart.) Blood circulation through heart. Special junctional tissue of heart.(Myogenic and neurogenic heartconducting system of heart. E.C.G. Cardiac cycle. Heart Sound , Blood vessels – type, Structure & function, Systemic & pulmonary circulation. Blood – composition, Function, blood group, Blood clotting. Cardiac cycle and cardiac output. Blood Pressure-regulation & controlling factors. 7.Renal System- Function of kidney, Anatomy & Histology of Nephron & collecting duet. – Urine formation(Filtration, reabsorbtion and secretion)- Counter – current system of urine concentration, Anomalies in urine concentration.	**12**
	TOTAL	**48**

TEXTBOOKS:

1.AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition,CBS Publishers, New Delhi, 2006

2. L Prakasam reddy, Fundamentals of Medical Physiology, 4th Edition, Paras medical Publisher, Hyderabad, 2008

3. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008

SYLLABUS (1ST SEM)

CORE PAPER III /SUBJECT NAME: GENERAL ANATOMY + GENERAL ANATOMY LAB
SUBJECT CODE: OPT242C103
SCHEME OF EVALUATION: (T + P) **L-T-P-C:2-1-1-4**

Course Objective:

The objective of this subject is to deal with the entire human anatomy with emphasis on different tissues, blood vessels, glands, nerves and the entire central nervous system in particular.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** the microscopic structures of various tissues, and organs in the human body.	**BT 2**
CO 2	**Comprehend** the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.	**BT 2**
CO 3	**Applying** the knowledge of the basic structure and connections between the various parts of the central nervous system.	**BT 3**
CO 4	**Analyse** the integrative and regulative functions on the organs and systems.	**BT 4**

SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Introduction of anatomy – gross human anatomy & their relations : The skeleton – axial & appendicular (over view), Cavities of body- (cranial, thoracic, abdominal, pelvic). Structure of bone, Type & function of bone, Blood & nerve supply of the bone. Planes of the body. Anatomical terminology. Skull – General features, Cranial bones (frontal, parietal, temporal, occipital, sphenoid, ethmoid). Facial bone – (nasal, maxilla, zygomatic, lacrimal, palatine, inferior nasal conchae, vomar, mandible). Special feature of the skull (sutures, paranasal sinuses, foramina, fontanels, nasal septum). Joints – classification, fibrous joints, cartilaginous joints, synovial joints(structure & types). Types of movement at sinovial joints. Anatomy of muscular system – Skeletal muscle structure. Important skeletal muscle (muscles of facial expression, mastication. Muscle that move the head). Over view of Trunk muscles, upper limb muscles, lower limb muscles. Anatomy of nervous system – spinal cord anatomy (external & internal anatomy). Connection & distribution of spinal nerves-overview(Branches, plexuses. Intercostal nerves). Overview of brain organization & blood supply. Brief anatomical idea on – brain stem, cerebellum, diencephalon, cerebrum. Cranial nerves	**9**
2	Embryology – general Gametogenesis(spermatogenesis & oogenesis) –Structure of testis,ovary &sperm –Phases of embryonic development – formation of three germ layers- derivatives of germ layers –Embryonic or Foetal membrane (chorion, amnion, allantois, yolk sac) &placenta & its functions.	**9**
3	Cell Structure: Ultra structure and functions of cell- Plasma membrane- Nucleus – Mitochondria- Centrosome- Ribosome-Endoplasmic reticulum- Golgi body & lysosome. Nucleus – Ultra structure & functions. Chromosomes: Structure & chemical composition, types of chromosome. Chromosome aberration.	**9**

4	Cell Division: Amitosis- Mitosis- Meiosis- Significance of mitosis & meiosis- Cell cycle. Tissues: Structure, position and functions of epithelial, connective, muscular & nervous tissue.	**9**
	TOTAL	**36**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Identification of skull & skeleton (bones)[Skull-bones comprising, base of skull orbits]	**4**
2	Identification of organs & viscera	**4**
3	Identification of histological tissues . a) Epithelial tissue-squamous, columnar, cuboidal b) Connective tissue-skeletal muscle, cardiac muscle, smooth muscle c) Cytology-mitosis.	**4**
	TOTAL	**12**

TEXT BOOKS:-

1. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, Churchill Livingstone.

2. G.J. TORTORA & N.P ANAGNOSTAKOS: Principles of Anatomy and Physiology. (recent edition)

3. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.

SYLLABUS (1ST SEM)

SEC PAPER /SUBJECT NAME: GENERAL PHYSIOLOGY

SUBJECT CODE: OPT242S111

SCHEME OF EVALUATION: (P) **L-T-P-C:0-0-4-2**

Total credits: 2

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Identification of fixed histological slides – nerve tissues (cerebellum, cerebral cortex, neurons, spinal cord, nodes of Ranvier, corneal cell space), renal tissues. Blood vessels (artery & vein),skin, Tongue, Liver. Hemoglobin estimation	**6**
2	Determination of blood pressure Determination of BT, CT, ESR	**6**
3	Blood film making & identification of different blood corpuscle. ECG wave identification	**6**
4	Measurement of TC of RBC & WBC & DC of WBC.. Determination of Blood Group (ABO; Rh).	**6**
	TOTAL	**24**

SYLLABUS (1ST SEM)

GE PAPER I /SUBJECT NAME: BIOCHEMISTRY

SUBJECT CODE: OPT242G101

SCHEME OF EVALUATION: (T) **L-T-P-C:3-0-0-3**

Total credits: 3

Course Objective:

The objective of this subject is to deal with the biochemical nature of carbohydrates, proteins, minerals, vitamins, lipids etc. A detailed study of these, emphasizing on their chemical composition and their role in metabolism is the required aim of this course.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the structure, function and interrelationship of biomolecules and consequences of deviation from normal.	**BT 1**
CO 2	**Identify** and describe the structure and function of major biomolecules (carbohydrates, proteins, lipids, and nucleic acids).	**BT 2**
CO 3	**Apply** knowledge of chemistry to predict the behavior of biological molecules in different environmental conditions.	**BT 3**

CO 4	**Integration** of the various aspects of metabolism, and their regulatory pathways. Principles of various conventional and specialized laboratory investigations and instrumentation, analysis and interpretation of a given data.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	1. Basic concept & metabolism of carbohydrate, protein & fat.Process of glycolysis, glycogenolysis, TCA cyclesignificance. Non Protein Nitrogen, Nitrogen balance, Metabolism of Amino acids, Transamination, Deamination. Process of ®-oxidation of unsaturated fatty acid, á & ⌉oxidation overview. 2. Amino acids, protein structures. a. Amino acids- Function, classification, properties b. Protein - Primary, secondary, tertiary & quaternary structures & the bond involves.	**9**
2	3. Brief outline: Enzyme- General characteristics, classification, Factors affecting enzymatic activity. Kinetics of Enzyme – km. Michaelis Menten equation. Line Weaver Burk plot. Enzyme Inhibition – Reversible & Irreversible. Allosteric enzyme. 4. Oxygen transporting protein Hemoglobin & Myoglobin – Structure & their characteristics. Comparison between hemoglobin & myoglobin. Oxygen transporting Mechanism of Hemoglobin affinity for Oxygen. Bohr's effect 5. Vitamins Water & Fat soluble Vitamins. Vitamins- A,D,E,KP,C B complex-source, daily requirement, Metabolism, Functions, deficiency.	**9**

3	6. Basic outline of hormone action Physical & Chemical Characteristics of hormone. Types of hormone. General mechanism of hormone action via Massenger system. Source & importance of different hormones-STH, ACTH, GTH , T4, parath hormone, Insulin, Glucagon, Glucocorticoid, Mineralocorticoid, Melatonin, Estrogen, Progesteron, Testosterone & HCG 7. Cornea – Biochemical composition of cornea. Sources of Nutrients-Oxygen, Glucose, Amino acid. Metabolic pathway in cornea – Glycolysis, HMP shunt. 8. Tear film- Functions of Tear film. Different layers of Tear film. Chemical composition of tears. Tear film abnormalities. Tests for film Adequacy.	**9**
4	9. Lens – Biochemical composition of lens. Lens protein – their types & characteristics. Lens Metabolism - Carbohydrate metabolism, protein metabolism. Cataract – Due to biochemical defects of lens. Antioxidant mechanism in the lens. 10. Biochemistry of the visual process Photopigments – Rhodopsin & Iodopsin. Chemical nature of Rhodopsin. Visual cycle (Bleaching of Rhodopsin, Transducin cycle, Role of Phosphodiestareses).	**9**
	TOTAL	**36**

TEXT BOOK:

1. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications, Chidambaram, India, 1992

2. S. Ramakrishnan, K G Prasannan and R Rajan: Text book of Medical Biochemistry, Orient Longman, Madras, 1990

3. D.R. Whikehart: Biochemistry of the Eye, 2ndedition, Butterworth Heinemann, Pennsylvania, 2003

SYLLABUS (2ND SEM)

CORE PAPER I /SUBJECT NAME: Physical Optics + Physical optics lab **SUBJECT CODE: OPT242C201** **SCHEME OF EVALUATION: (T + P)** **L-T-P-C:3-0-2-4** **Total credits: 4**

Course Objective:

The objective of the subject is to study of light, its properties and its interaction with matter. Specifically, the phenomena of interference, diffraction, polarization and scattering will be dealt with in detail.

Course outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	The outcome from this course is to equip the students with thorough **knowledge** of properties of light.	**BT 1**
CO 2	**Understand** the mathematical frameworks used to describe light as a wave, such as Maxwell's equations and the wave equation.	**BT 2**
CO 2	**Apply** the principles of wave optics to solve problems involving the behavior of light in various media and under different boundary conditions.	**BT 3**
CO 1	**Analyze** complex optical phenomena to deduce the properties of the system, such as coherence, spectral composition, and the spatial distribution of light.	**BT 4**

SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Dual nature of light- Simple harmonic motion- differential; Simple harmonic waves- mathematical representation; Super position of simple harmonic waves. HUYGENS' principle – laws of reflection and refraction at plane and spherical surfaces. Wave velocity & group velocity; determination of velocity of light (any one method.)	**9**
2	Interference: Coherence; path and phase difference; Theory of interference fringesintensity distribution infringes; Young's double slit experiment- Fresnels' biprism, Lloyds' error experiments; visibility of fringes. Interference in thin films due to reflected and transmuted light- Interference in wedge Shaped films; Newton's ring experiment ; Color of thin films; Thin film antireflection wating and filters.	**9**
3	Diffraction: Diffraction by single slit; double slit, multiple slit- grating, circular aperture – amplitude & intensity distribution (final expressions only) Circular aperture- airy pattern, resolution by circular apertures. Diffraction grating- reflection, traasnussion , amplitude & phase gratings(definitions in brief) Grating dispersion & dispersue power, spectral resolution; zone plates.	**9**
4	Polarization & Crystal Optics: Concept of polarization , linear , circular , elliptical polarization (qualitatively), Plane of polarization & vibration, degree of polarization, polarizes, analyzers, Production of polarized light, birefringence, calculate crystal , veal prism, Wallaston prism , retarders - full, half & quarter wave plates, analysis of light of unknown Polarization. Linear Scattering- Raleigh & Mce Principles of LASERs Holography – basic principle; simple experimental arrangement, some applications.	**9**
	TOTAL	**36**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	To determine the wavelength of a monochromatic light source with the help of Fresnel's Biprism. To determine the radius of curvature of convex surface of a lens by Newton's ring method.	**6**
2	To determine Planck's constant using photocell. To study the diffraction through a single slit & to determine its width.	**6**
3	To determine the slit width & the separation between the slits of a double slit system from its Fraunhoffer diffraction pattern. Determination of the wavelength of monochromatic light using diffraction grating.	**6**
4	To calibrate a Polarimeter & hence to determine the unknown concentration of sugar solution. To determine the wavelength of the Laser source by forming diffraction pattern with transmission grating.	**6**
	TOTAL	**24**

TEXT BOOK:

1. Subrahmanyan N, BrijLal, A text book of Optics, S. Chand Co Ltd, New Delhi, India, 2003.

2. Pedrotti L. S, Pedrotti Sr. F. L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.
3. Keating NM. P, Geometric, Physical and Visual Optics, Butterworth- Heinemann, Massachusetts, USA

SYLLABUS (2ND SEM)

CORE PAPER II /SUBJECT NAME: OCULAR PHYSIOLOGY

SUBJECT CODE: OPT242C202

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

The objective of the subject is to deal with the physiological functions of each part of the eye.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and describe the fundamental principles of physical optics, including wave propagation, interference, diffraction, and polarization.	**BT 1**
CO 2	**Explain** the normal functioning of all structures of the eye and their interactions	**BT 2**
CO 3	**Apply** knowledge of ocular physiology to explain processes such as the visual cycle, light perception, and signal transduction in the retina.	**BT 3**
CO 4	**Linking** the physiological aspects of normal growth and development of the eye	**BT 4**

SYLLABUS

MODULE	TOPICS & COURSE CONTENT	PERIODS

1	Cornea: Brief idea about ultra & histological structure of cornea. Corneal transparency & hydration, Regulation of corneal transparency & hydration. Corneal vascularization. Maurice theory & Goldman's theory Uveal tissue: Brief idea about uvea. Uveal meshwork. Uveo-scleral drainage. Schlemm's canal switch. Lens: Basic idea about human lens. Function of lens. Lens transparency. Lens culture. Changes in ageing lens. Cataract – overview. Aqueous humour: Formation of Aqueous humour. Drainage & circulation of Aqueous Humor. Rates of production & flow. Functions of Aqueous humour. Vitreous Humour: Composition & distribution of vitreous humour, Physiology & function of vitreous humour, Optical role of vitreous humour. Retina: Retinal structure-layers of retina. Brief idea about rod & cones. Organization of retina. Function of retina. Optic Nerve: Physiology of optic nerve. Papilledema of optic nerve. Optic atrophy. Ocular Circulation : Vascular structure of the eye – ocular circulation, blood-ocular barrier (Blood-retinal, blood Vitreous & blood aqueous barrier). Regulation of ocular circulation.	**12**
2	Protective Mechanism of the eye – Blinking – muscles of lead closer & lid opening (orbecularis occulli, levator palpebre, Muller's muscle, blinking reflexes. Lacrimation – i) Lacrimal glands ii) Pre corneal tear film iii) Chemistry of lachrymal secretion tear film iv) Tear film dynamics (secretion of tear, formation of tear, retention & redistribution of tear, displacement phenomena, evaporation from tear film, drying & breakup of tear film, dynamic events during blinking, elimination of tear	**12**

3	The ocular motor system – a. Extra ocular muscles their function & nerve supply b. Mechanics of actions of extra ocular muscles -cross sectional area of muscle, length of muscle. Arc of contact, muscle plane, Muscle axis of rotation. c. Physiology of ocular movement – Basic Kinematics, (position of gaze, Fick's axes) d. Ocular Movement (monocular and Binocular). Supra nuclear control of eye movements. e. Ocular movements - i) Monocular Movements (Adduction, Abduction, supraduction, Infraduction, Incycloduction, excycloduction) ii) Binocular Movements –VERSIONS- (saccadic & pursuit movement, position maintenance movements, stabilization movements & their characteristics). VERGENCES – (Convergence, divergence, vertical vengeance), Intraocular pressure – Features of normal IOP, Factors influencing the IOP,Control of IOP,Measurement of IOP. Pupil – Normal pupil, Physiological changes in pupil size – Isocoria, Pupillary unrest, Hippies. Pupillary reflex – Light reflex, Near reflex, Darkness reflex , Psycho sensory reflex, Lid closure reflex	**12**

4	Accommodation – a. Far point , near point, range & amplitude of Accommodation b. Mechanism of accommodation – Increased tension theory, Relaxation theory, Role of lens capsule, Gullstrand mechanical model of accommodation, c. Stimulus for accommodation d. Ocular changes in accommodation. e. Changes in accommodation with arc (Presbyopia) f. Nervous mechanism for accommodation Color visiona. Physiological, Photochemical & neurological basis of color vision b. Electrophysiology of color vision c. Granit's modulator and dominator theory, Purkinje phenomenon. Young-Helmholtz theory d. Types of color defects e. Color blindness f. Neural analysis Geneculate cortex: a. Structure of geneculate cortex. b. Electrophysiology c. Projection – retinal projection d. Detail idea about visual cortex & function of visual cortex. Visual perception – Higher integrative activity, Binocular perception, stereoscopic depth perception. b. Neurophysiology of perception – Higher visual pathways(primary visual Pathway to cerebral center, Lateral Geniculate body, non-geniculate targets for retinofugal input, visual center) c. Neurophysiology of perception – Spatial analysis, Double pathway to higher visual centers. Physiology of vision – a. Visual acuity – visual angle, Components of Visual acuity (Minimum visible, Resolution , Recognition Hyperacidity), Factors affecting, Measurement of visual acuity. b. Contrast Sensitivity – Types- (spatial & Temporal contrast sensitivity), Neural Mechanism, Measurement of contrast sensitivity (Arden gratings , Cambridge low contest gratings, Pelli – Robson chart) c. Light & Dark adaptation – Dark adaptation curve, Mechanism of dark adaptation, Factors influencing dark adaptation, Time course of light adaptation, Mechanism of light adaptation, Rod vs. cone light adaptation.Parkinje shift of spectral sensitivity. d. Binocular vision – Grades of binocular vision (simultaneous, fusion & stereopsis), Advantages of binocular vision, visual direction & horopter, Binocular fusion, Dichoptic stimulation , Depth perception, Integration of motor & sensory system. e. Electrodiagnostic tests – ERG, EOG, VER	**12**
	TOTAL	**48**

TEXT BOOK:

1. 1.AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006
2. RD Ravindran: Physiology of the eye, Arvind eye hospitals, Pondicherry, 2001
3. PL Kaufman, A Alm: Adler's Physiology of the eye clinical application, 10th edition, Mosby, 2002

SYLLABUS (2ND SEM)

CORE PAPER III /SUBJECT NAME: OCULAR ANATOMY

SUBJECT CODE: OPT242C203

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

The objective of this subject is to deal with detailed anatomy of the orbit, eyeball and cranial nerves associated with ocular functions.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and describe the anatomical structures of the eye, including the cornea, lens, retina, and optic nerve.	**BT 1**
CO 2	**Understand** the basic principles of ocular embryology.	**BT 2**
CO 3	**Demonstrate** the ability to identify anatomical structures of the eye using diagrams and models.	**BT 3**
CO 4	**Analyze** the relationship between the anatomical structures of the eye and their functions in normal and pathological conditions	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Embryology –ocular Formation of optic vesicle & optic stalk, formation of lens vesicle, formation of optic cup, changes in associated mesoderm, development of various structure of eye ball – retina, optic nerve, crystalline lens, cornea, sclera, choroid, cilliary body, iris, viterous. Development of accessory structures of eyeball – eyelids, lacrimal apparatus, extra-ocular muscles, orbit. Milestones in the development of the eye. Orbit Bony orbit: Size, shape & relations, walls of the orbit , Base of the orbit, Apex of orbit. Orbital fascia : Fascial bulbi , Fascial sheaths of extraocular muscles, intermuscular septa. Spaces of orbit : Orbit fat & reticular tissue - Apertures at the base of orbit- Contents of the orbit - Orbital Nerve:oculomotor , Trochler, Abducent, Trigeminal, facial nerves - their functional components, course & distribution, clinically applied aspects.	**12**
2	Cornea: (a)Layers & peculiarities,(b). Blood supply & nerve supply of cornea. .(c) Corneal Transparency. Lens , Zonules : (a) Structure. of lens →capsule, Ant. Epithelium, lens fibers (structured & zonal arrangement). (b). Ciliary zonules :structure gross appearance,(c). Arrangement of zonules fibers. Uveal Tract & its vascular supply:(a). Iris macroscopic & microscopic appearance . (b) ciliary body – Macroscopic structure.(c). chloride - Macroscopic structure.(d) Blood supply to uveal structure- short & Long Posterior artery & Anterior Artery. (e). Venous drainage. Vitreous- main masses of vitreous. Base of the vitreous. Hyaloidean vitreous. Vitreous cells. Sclera – Anterior, posterior & middle apertures. Episclera. Sclera proper. Lamina fusca. Blood supply of the sclera. Nerve suply of the sclera. Anterior chamber and its angle- angle of the anterior chamber. Trabecular meshwork. Canal of Schlemm. Schwalbe's line. Drainage of aqueous humor.	**12**

3	Retina & its vascular supply : (a). Gross anatomy,(b). Microscopic structure of fovea centralize, (c). Blood retinal barrier.(d.) Anatomy of optic nerve, (e). Anatomy of optic nerve, (f.) optic chaisma optic tracts, (g) Lateral Geneculate body, (h). optic radicalism (i). visual cortex, (j). Arrangement of nerve fibers.(K). Blood supply of visual pathways (Arterial circle of willis & its branches). The Ocular motor system : Extraocular muscles, nerve supply, motor nuclei, supra nuclear motor centers. The pupillary & ciliary muscle :Anatomy of sphincter & Dilator muscle. Ciliary muscle – Anatomy, types The nerve supply of the eye ball. The lachrymal appears : (a) Lachrymal gland, (b) Palpebral part, (c) Duets of lachrymal gland, (d) structure of the lachrymal gland, (e) Blood supply & nerve supply of the lachrymal gland, (f) lachrymal passages.	**12**
4	Anatomy of the Ocular Adnexa & glands; Lids - a. Structures of the lids: - Skin, Subcutaneous Areolar Layer, Layer of Staiated muscle, Submuscular Areolar Tissue, Fibrous Layer, Conjunctiva.Glands of the Lids- Meibomaian Glands, Glands of Zela and Glands of Moll. Blood Supply of the Lids, Lymphatic Drainage of the Lids, Nerve Supply of the Lids. Conjunctiva - Palpebral Conjunctiva, Bulbar Conjunctiva, Conjunctival Fornix, Microscopic Structure of the conjunctiva- Epithelium, Substantia Propria. Conjunctival Glands→ Krause's Glands, Wofring's Glands, Henley's Glands, Manz Glands. Blood Supply of the Conjunctiva, Nerve Supply of the Conjunctiva, Caruncle, Plica Semilunaris.	**12**
	TOTAL	**48**

TEXTBOOK: AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006

SYLLABUS (2ND SEM)

SEC PAPER /SUBJECT NAME: OCULAR ANATOMY

SUBJECT CODE: OPT242S211

SCHEME OF EVALUATION: (P) **L-T-P-C:0-0-4-2**

Total credits: 2

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Identification of ocular histology slides.	**8**
2	Identification of projection slides of Ocular Anatomy.	**8**
3	Identification of structure & related viva.	**8**
	TOTAL	**24**

SYLLABUS (2ND SEM)

GE PAPER I /SUBJECT NAME: COMPUTER FUNDAMENTALS & PROGRAMMING + COMPUTER FUNDAMENTALS & PROGRAMMING LAB

SUBJECT CODE: OPT242G201

SCHEME OF EVALUATION: (T) **L-T-P-C:2-0-2-3**

Total credits: 3

Course Objective:

The objective of the course is to focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

Course Outcome

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the basic concepts and terminology of computer systems and their applications.	**BT 1**
CO 2	**Describe** the functions of different components of a computer system and their interactions.	**BT 2**
CO 3	**Apply** the knowledge of computer hardware and software to troubleshoot common issues.	**BT 3**
CO 4	**Analyse** the role of computer technology and able to gain hand-on experience in using computers	**BT 4**

SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	COMPUTER FUNDAMENTALS AND PROGRAMMING Basic computer Architecture: Fundamentals of Computers, Block diagram of PC, peripheral devices of PC and their functions Number System & Data Representation: Decimal Number System, Binary number system, Decimal to Binary conversion, Binary operations. Octal number system & the conversion. Octal to Decimal. Binary to Octal & Vice Versa.	**6**
2	Boolean Algebra: Definition, Difference between Boolean with Arithmetic & ordinary algebra. Two valued Boolean Algebra. Basic theorems of Boolean Algebra. Precedence of voperators. Boolean function & truth tables. The AND, OR, NOT gate. DeMorgans theorem. The NOR, NAND gate. The XOR & X-NOR gate. Conversion of Boolean expression into logic diagram. Using AND, OR, AND, NOT gates. Logic Circuits: Combinational logic circuit, Adder , Subtractor, Decoder, Encoder.	**6**
3	Operating System: Introduction & classification of software, working principle of MS DOS (Some basic internal & external commands). Creating a file. Windows & its components. Accessories, program manager, main, desktop icons. MS- Office: Introduction of word processing-invoking MS-word – create, edit, save document, cut & paste perform operations on blocks of text, header & footer, Mail Merge, printer setup. Introduction of EXCEL. Concept of worksheet, making Charts & graphs, perform calculations & re calculations.	**6**
4	C-Language: Overview of C , algorithm & flow chart, datatypes . Variables & constants, operators, expressions & assignment statements, control statements, arrays in C (One dimensional). Introduction to Internet: Basic concepts of Internet.	**6**
	TOTAL	**24**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Operating System: Introduction & classification of software, working principle of the DOS (some basic internal & external commands). Creating a file, batch processing. Autoexec Bat files. Windows & its components-Accessories, program manager, desktop icons.	4
2	MS- Office: Introduction of word processing-invoking MS-word – create, edit, save document, cut & paste perform operations on blocks of text, header & footer, Mail Merge, printer setup. Introduction of EXCEL. Concept of worksheet, making Charts & graphs, perform calculations & re calculations.	4
3	C-Language: Overview of C , algorithm & flow chart, datatypes. Variables & constants, operators, expressuions & assignment statements, control statements, arrays in C (One dimensional).	4
	TOTAL	12

TEXT BOOK:

1. Basic Computer Skills (K. Adinarayan)

2. Computer Fundamentals (Pradeep K Sinha, Priti Sinha)

SYLLABUS (3RD SEM)

CORE PAPER I /SUBJECT NAME: VISUAL OPTICS I

SUBJECT CODE: OPT242C301

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

The objective of the subject is to deal with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.

Course Outcome: Upon completion of the course, the student should be able:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** various optical instruments and their components.	**BT 1**
CO 2	**Understand** the fundamentals of optical components of the eye	**BT 2**
CO 3	**Apply** the laws of refraction and reflection to solve basic problems in optics	**BT 3**
CO 4	**Integrate** theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Review of Geometrical Optics: From Geometrical Optics. Schematic and reduced eyes and their properties.	**12**
2	Optical constants of the eye and their measurement. Purkinje images. Corneal curvature and thickness. Keratometry and pachometry. Indices of aqueous and vitreous. Optical Defects of the Eye- Shape of Cornea, Shape & RI of the lens, Optical axis, Visual axis (angle alpha, Fixation axis (angle gamma), Aberration of the Optical system of eye, Depth of focus, Diffraction & resolving power	**12**
3	Emmetropia and ametropia, Axial versus spherical ametropia, Myopia Hypermetropia(Hyperopial) Astigmatism.	**12**
4	Accommodation- possible mechanism of accommodation- Schiener disc experiment- theories of accommodation- modern theory- changes in the lens during accommodation- the amplitude of accommodation- the measurement of the amplitude n of accommodation- depth of field, luminance and blur tolerance- amplitude of accommodation versus age. Presbiopia-near vision addition- estimate of addition-unequal near vision addition- effect of changing the spectacle distance – hypermetropia and accommodation.	**12**
	TOTAL	**48**

TEXT BOOK:

1. A H Tunnacliffe: Visual optics, The Association of British Optician, 1987

2. AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998

SYLLABUS (3RD SEM)

CORE PAPER II /SUBJECT NAME: OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE + OPHTHALMIC & OPTICAL INSTRUMENTATION & PROCEDURE LAB
SUBJECT CODE: OPT242C302

SCHEME OF EVALUATION: (T + P) **L-T-P-C:3-0-2-4**

Total credits: 4

Course Objective:

The objective of this course to cover commonly used optometric instruments, its basic principle, description and usage in clinical practice.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Upon completion of the course, the student should be able to gain theoretical **knowledge**, basic practical skill in handling the instruments.	**BT 1**
CO 2	**Explain** the basic principles of ophthalmic and optical instruments.	**BT 2**
CO 3	**Demonstrate** the ability to apply optical principles to diagnose and correct vision problems.	**BT 3**
CO 4	**Analysing** and **interpretation** of various report results	**BT 4**

SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Detailed study of the Principles of operation, types, optical properties, constructions, adjustments and applications of the following Instruments and Devices: Binoculars, telescopes and projectors. Simple and Compound Microscopes (with Huygens and Ramsden Eye pieces and oil immersion objectives). Spectrometer. Lensometer Trial case lenses-best forms. Trial frame design. Cross cylinder	**9**
2	Radiuscope Retinoscopes Standard Tests Charts. Devices for color vision testing – CS testing / Glare testing. Ultrasonography – (A scan, B scan) – Principles and application. Autorefractometer- subjective and objective types	**9**
3	Opthalmoscopes- direct and indirect types. Refractometers- Auto refractors, Dioptron Slit lamp Biomicroscope Keratometer Tonometer – Principles, types, clinical importance as a routine procedure (application) Pachometer – Principles, types, clinical importance	**9**
4	F.F.A – Principles and demonstration of film. OCT- Principles and demonstration PAM – Principles and importance. Perimeter – Basics of perimetry – Humphray instruments, Automated perimetry – basics, types(names) , interpretation of normal Glaucoma Field of Definition. LASER – Introduction – Einstein co-efficient, population inversion. Different types of LASER (mention) – Excimer, Lasik Nd-yag, Argon, Diode, He-Ne gas LASER, Xenon. LASER safety, Ophthalmic LASER application(Argon, Yag) **New Advancements in instruments**	**9**
	TOTAL	**36**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Focimeter or Lensometer. Retinoscope.	**3**
2	Standard Test Charts. Autorefractometer Devices for color vision testing	**3**
3	Slit Lamp Examination. Tonometer Keratometer.	**3**
4	Opthalmoscope. Auto Perimeter-Normal HFA,printout A-scan:- Normal Print Out & analysis B-scan:- Normal Print Out & analysis	**3**
	TOTAL	**12**

TEXT BOOK:

1. T Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinneman, USA, 2007.

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

3. D B. Elliott :Clinical Procedures in Primary Eye Care,3rd edition, Butterworth-Heinemann, 2007

SYLLABUS (3RD SEM)

DSE PAPER I /SUBJECT NAME: MEDICAL PATHOLOGY & MICROBIOLOGY

SUBJECT CODE: OPT242D301

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

The objective of this subject is to deals with basic biological, biochemical and pathogenic characteristics of pathogenic organisms.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** basic principles of diagnostic ocular Microbiology, To prepare the students to gain essential **knowledge** about the characteristics of bacteria, viruses, fungi and parasites;	**BT 1**
CO 2	**Explain** the mechanisms of disease transmission and infection	**BT 2**
CO 3	**Apply** diagnostic techniques to identify pathogens in clinical samples.	**BT 3**
CO 4	**Analyze** the results of microbiological tests to determine the presence and type of infection.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS

1	Bacteria: Cell structure, elementary idea about classification and morphological basis. Staining reactions: Gram staining, spore staining, acid fast staining. Bacterial growth: nutritional requirements, physical factor affecting, culture media, and growth curve. Elementary idea about bactericidal agents: Phenol, alcohol. Sterilization(principles, types & methods). Pasteurization. Antibiotics: Bacteriostatic and bactericidal effects. Virus: elementary knowledge of viral-morphology, viral genome and classification, viral replication. Herpes viruses, hepatitis viruses, miscellaneous viruses, human immunodeficiency viruses.	**12**
2	Microbial growth & death, Laboratory culture, host pathogen interactions, antimicrobial chemotherapy, pathogenic mechanisms common to external ocular infections process – clinical pathology. Physiology, pathology, treatment & epidemiology of infectious diseases caused by bacteria, virus, fungi & parasitic organisms with emphasis to disease with ocular manifestations & infectious eye diseases in hot climate as in India. AIDS & eye.	**12**
3	General Pathology Structure & function of immune system – Structure and function of thymus, spleen & red bone narrow- Immunity & its types , plasma proteins & immune reaction, cells involved in immune system. Humoral immunity theories of antibodies formation. Structure & function of lymph nodes. Structure & function of thymus, spleen & red bone narrow. Non specific immunity, Antibody mediated immunity, specific immunity, cell modified immunity, Active immunity, Passive immunity. The acute inflammatory reaction – changes in acute inflammation, changes in the calibre of the blood vessels, changes in blood flow, changes associated with exudation. Local sequelae of acute inflammation. The chemical mediators of acute	**12**
4	Inflammation & Repair: inflammation. Role of the mast cell in inflammation. Role of the platelets in inflammation. Chronic inflammation – cause, classification, general features. Source of infection. Transmission of organisms to the body. wound infections. Wound healing. Immuno-pathogenesis – type I, II, III & IV hypersensitivity. Mechanism of autoimmunity. Organ specific & non organ specific auto immune disease. The HLA system – histocompatibility complex. Pyogenic & bacterial infection.Gralt rejection-basic outline. Disorder of growth – metaplasia, dysplasia, neoplasia. Circulatory disturbances – thrombosis, infarction, ischemia, embolism. Degeneration (calcification).	**12**
	TOTAL	**48**

TEXT BOOK:

1. BURTONG .R.W:Microbiology for the Health Sciences, third edition,J.P.LippincottCo., St. Louis, 1988.

2. MJPelczar (Jr),ECSChan, NRKrieg: Microbiology, fifth edition ,TATAMcGRAW-HILL Publisher, New Delhi,1993

3. K S Ratnagar: Pathology of the eye & orbit, Jaypee brothers Medical Publishers, 1997

SYLLABUS (3RD SEM)

DSE PAPER II /SUBJECT NAME: MEDICAL PSYCHOLOGY

SUBJECT CODE: OPT242D302

SCHEME OF EVALUATION: (T) **L-T-P-C:4-0--0-4**

Total credits: 4

Course Objective: This course covers various aspects of medical psychology essential for the optometrist.
Course Outcome: Upon completion of the course, the student should be able:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Knowledge** various aspects of medical psychology essential for him to **apply** in the clinical scenario during his clinical postings	**BT 1**
CO 2	**Demonstrate** the ability to apply psychological concepts to diagnose and treat patients in a clinical setting.	**BT 1**
CO 3	**Use** psychological theories to explain patient behavior and treatment outcomes in various medical case studies.	**BT 1**
CO 4	**Analyze** various psychological theories that explain the mind-body connection	**BT 1**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Introduction to Psychology Intelligence Learning, Memory, Personality, Motiviation	**12**
2	Body Integrity – one's body image The patient in his Milen	**12**

3	The self-concept of the therapist, Therapist-patient relationship – some guidelines Illness, its impact on the patient Maladies of the age and their impact on the patient's own and others concept of his body image	**12**
4	Adapting changes in Vision Why Medical Psychology demands commitment?	**12**
	TOTAL	**48**

TEXT BOOK: Patricia Barkway. Psychology for health professionals, 2nd edition, Elsevier, 2013

SYLLABUS (3RD SEM)

GE-1 PAPER /SUBJECT NAME: PHARMACOLOGY

SUBJECT CODE: OPT242G301

SCHEME OF EVALUATION: (T) **L-T-P-C:3-0-0-3**

Total credits: 3

Course Objective:

The objective of the subject is to provide actors of fundamental information and the general principals underlying the uses of pharmacological agents in the practice of medicine.

Course outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	gain the **knowledge** of the basic principle of pharmacokinetics & Pharmacodynamics	**BT 1**
CO 2	**List** the major classes of drugs and their mechanisms of action on the body.	**BT 2**
CO 3	**Categorize** the commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects.	**BT 3**
CO 4	**Analyze** the pharmacokinetic and pharmacodynamic processes of various drug classes.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	General Pharmacology: Nature & Sources of drug. Routes of drug administration (general & Ocular). New drug delivery systems. Absorption & Bio availability of a drug. Distribution of a drug. Fate of a drug. Drug excretion & toxicity. Pharmacokinetics of drugs. Drug action: site of drug action, structure activity relationship. Drug receptor. Mechanism of action of a drug. Dose response relationship. Adverse drugs reactions (ADR) in man, Manifestations of ADR. Treatment of Acute drug poisoning. Factors influencing drug metabolism & drug action. Classification of drugs.	**9**
2	Drug action on the nervous system→ General Considerations. Aliphatic Alcohol's. General Anesthetics. Sedatives, Hypnotics and Pharmacotherapy of Insomnia. Drugs Effective in Convulsive Disorders. Opioid Analgesics. Analgesic – Antipyretics and Nonsteroidal Anti-inflammatory Drugs(NSAID). Central Nervous System Stimulants. Local Anesthetics→ Cocaine, Procaine and Other Synthetics Local Anesthetics. Autonomic Nervous System → General Considerations. Adrenergic and Adrenergic Blocking Drugs.	**9**
3	Ocular Preparation and packaging of ophthalmic drugs Drug action and effectiveness Ocular penetration	**9**
4	Ophthalmic diagnostic drugs. Topical anesthetics Ophthalmic Drugs – antibiotics, corticosteroids, anesthetics, viscoelastics agents. Antiglaucomic drugs.	**9**
	TOTAL	**36**

TEXT BOOK:

1. K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004

2. Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996

3. T J Zimmerman, K S Kooner : Text Book of Ocular Pharmacology, Lippincott-Raven, 1997

SYLLABUS (4TH SEM)

CORE PAPER I/SUBJECT NAME: OCULAR DISEASE I (ANTERIOR SEGMENT DISEASE) **SUBJECT CODE: OPT242C401** **SCHEME OF EVALUATION: (T)** **L-T-P-C:3-1-0-4** **Total credits: 4**

Course Objective:

The objective of the course is to deal with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	At the end of the course the students will be **knowledgeable** with the various aspects & **interpretation** of ocular diseases.	**BT 1**
CO 2	**Explain** the underlying mechanisms and clinical features of common ocular diseases such as glaucoma, cataracts, macular degeneration, and diabetic retinopathy.	**BT 2**
CO 3	**Use** clinical signs and symptoms, along with diagnostic test results, to identify ocular diseases.	**BT 3**
CO 4	understand and **analyse** disease conditions and plan proper treatment/management for the patient.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS

1	Anterior segment ocular diseases involving orbit, eyelids, adnexa, conjunctiva, cornea, urea, sclera, anterior chamber, iris and lens. Symptomatology, clinical signs, diagnosis, pathogenesis, pathophysiology , systemic disease relationships and treatment of degenerative, infections and inflammatory conditions affecting these structures. Disease of the Lids – Congenital Deformities of the Lids .Oedema of the Lids. Inflammatory Conditions of the Lids. Deformities of the Lid Margins. Deranged Movement of the Eyelids. Neoplasm's of the Lids. Injuries of the Lids. Diseases of the Lachrymal Apparatus-. Dry Eye. Disease of the Lachrymal Gland. Disease of the Lachrymal Passages. Operations for Chronic Dacryocystitis.	**12**
2	Disease of the Conjunctiva- Subconjunctival Haemorrhage Infective Conjunctivitis. Follicular Conjunctivitis. Granulomatous Conjunctivitis. Allergic Conjunctivitis. Conjunctivitis Associated with Skin conditions. Degenerative conditions of the Conjunctiva. Vitamin- A Deficiency. Cysts and Tumours of the Conjunctiva. Conjunctival Pigmentation . Injuries of the Conjunctiva. Disease of the Cornea –Congenital Anomalies. Inflammation of the Cornea (Keratitis). Superficial Keratitis. Deep Keratitis. Vascularisation of Cornea. Opacities of the Cornea. Keratoplasty. Corneal Degenerations. Corneal Dystrophy's. Corneal Pigmentation. Corneal Injuries. Refractive Corneal Surgery. Corneal Ulcer (Bacterial , Viral , Fungal)	**12**
3	Disease of the Sclera- Episcleritis. Scleritis. Staphyloma of the Sclera. Blue Sclerotic Scleromalacia Performs. Nanophthalmos. Injuries of the Sclera. Disease of the Iris.-. Congenital Anomalies. Inflammations (Anterior Uveitis) . Specific Types of Iriodocyclitis . Degenerations of the Iris. Cysts and Tumours of the Iris. Injuries of the Iris. Disease of the Celery Body- Inflammations of the Celery Body. Purulent Iriodocyclitis (Panophthalmitis) . Evisceration . Sympathetic Opthalmia. Vogt-Koyanagi – Harada Syndrome. Tumours of the Celery body. Injuries of the Celery body.	**12**

4	Glaucoma- .Formation of Aqueous Humor. Drainage of Aqueous. Intraocular Pressure(IOP) . Ocular Rigidity. Tonography. .Developmental Glaucoma (Buphthalmos) . Primary Narrow Angle Glaucoma. Primary Open Angle Glaucoma. Normotensive Glaucoma . Ocular Hypertension . Secondary Glaucoma. Surgical Procedures for Glaucoma(Steps Only) ,YOGPI ,trabeculectomy.Laser Procedure in Glaucoma . Artificial Drainage Devices in Glaucoma Surgery(Molteno). Disease of the Lens- Congenital Malformations. Cataract . Congenital and Developmental Cataract . Senile Cataract. Traumatic Cataract. Complicated Cataract. Secondary Cataract . After Cataract. Dislocation of the Lens. SurgicalProcedures for Removal of the Lens(Operative Steps Only). Phacoemulsification(ICCE,ECCE,IOL) . Small Incision Cataract Surgery (Manual Phaco).Intraocular Lens Implantation-AC+PC, IOL.	**12**
	TOTAL	**48**

TEXT BOOK:

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

2. Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990

3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth-Heinemann, 2007

SYLLABUS (4TH SEM)

CORE PAPER 2 /SUBJECT NAME: OPHTHALMIC LENS & DISPENSING OPTICS

SUBJECT CODE: OPT242C402

SCHEME OF EVALUATION: (T) **L-T-P-C:3-1-0-4**

Total credits: 4

Course Objective:

The objective of the subject is to deal with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect. In addition deals with role of optometrists in optical set-up.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Acquire skills/**knowledge** of various types of lenses, their grinding process, knowledge of various ophthalmic prisms etc.	**BT 2**
CO 2	**Analyse** various facial shapes & dispense various spectacle lenses, frames. Do final checking of finished spectacle with frame adjustments , troubleshooting complaints, delivery and follow up.	**BT 4**

SYLLABUS

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Ophthalmic lens : Characteristics of lenses: Introduction. Spherical lenses. Plano-cylindrical lenses. Sphero-cylindrical lenses. Designation of lens power. Power of lenses. Transposition. Write the prescription. Base curve of spherical lens. Base curve of cylindrical single vision lens. Aberration of lens. Prism prescription. Prism effects in a lens. Neutralization. Spectacle lenses: Characteristics of lens materials. Specific gravity (weight). Refractive index. Abbe number. Impact resistance. Scratch resistance.Curve variation factor. Current materials: Crownglass. CR-39. High –index glass. High –index plastic. Poly carbonate. Photochromatic materials. Lens types: Single vision lens. Bi-focal lenses. Tri-focal lenses. Vocational & occupational multifocal progressive lenses.	**12**
2	Introduction of bi-focal lenses: History of bi-focal lenses. Modern bi-focal designs. Types of bi-focal designs. Glass tri-focal lenses. Invisible multi-focal Double segment lens. Plastic bi-focals. 6.Opthalmic lens coating: Anti-reflecting coatings. Special notes concerning anti-reflecting coatings. Protective coating, color coating. Absorptive lenses: Classification of lens tints. Chemical that produces color & assist in absorptive characteristics of glass lenses. Effect in prescription on lens color. Availability of tinted lenses. Impact resistant lenses: Types of impact resistant lenses. Plastic lenses. Impact resistant Dress-Eye wear lenses. Tempered glass lenses. Types of impact resistant lenses most beneficial of specific patients. Lens for special uses: Fresnel lenses. Thinlite lenses. Lenses for the Aphakic patient. Aspheric lenses. Lens surfacing & quality. Principles of lens surface generation. Glass assessment. Faults in lens materials & lens surface. Inspection of lens quality.	**12**

3	Basics of dispensing: Spectacle frame Current frame materials: a) Plastics b) Metals Frame types: a) Combination of frames b) Half-eye frames c) Mounts d) Nylon-cord frame e) Special purpose frames. Frame measurements: a) The boxing system b) The datum system c) Comparison of the two systems d) Lens position e) Segment specification Frame Selection: a) Fashion b) Function c) Feel d) Conflicting needs e) Price f) Standard alignment Lens Selection: a) Ground rule for selection b) Selection criteria Facial Measurement: a) The PD b) Visual axes c) Measuring inter papillary distance d) Using PD ruler e) Common difficulties in measuring PDs f) Measuring monocular PD g) Measuring near PD	**12**

4	Measuring heights: a) Single vision b) Multi focal c) Bi-focal d) Progressive Pediatric Dispensing: a) The changing image of spectacle b) Age differences. Frame Selection a) Technical Criteria b) Fashion criteria c) Some tips on selection Lens Selection Technical criteria a) Communicating with kids. b) The kids corner Facial measurement of the kids a) PDs b) Centers c) Bi-focals Dealing with problems: a) Dealing with clients b) Common client problems c) Dealing with professional colleagues d) Dealing with the laboratories Special needs dispensing: a) Occupational dispensing b) Hazards in the work place c) Occupational health safety legislation d) Common hazards. Eye protection: a) Industrial eye protection b) Sport c) Standards covering eye protection d) Lens materials & impact resistance e) Frame & eye protection.	**12**
	TOTAL	**48**

TEXT BOOK:

1. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth –Heinemann, 2008
2. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996

3. C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rdedition, Butterworth - Heinemann, 2007

4. Michael P Keating: Geometric, Phisical& Visual Optics, 2nd edition, Butterworth – Heinemann, 200

SYLLABUS (4TH SEM)

DSE PAPER I /SUBJECT NAME: CLINICAL REFRACTION 1 + CLINICAL REFRACTION LAB

SUBJECT CODE: OPT242D401

SCHEME OF EVALUATION: (T+P) **L-T-P-C:3-0-2-4**

Total credits: 4

Course Objective:

This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect. In addition deals with role of optometrists in optical set-up.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the fundamentals of optical components of the eye	**BT 2**
CO 2	**Describe** the basic principles of optics, including light propagation, refraction, and reflection, and their relevance in clinical refraction.	**BT 2**
CO 3	**Demonstrate** the ability to perform various refraction techniques, including retinoscopy and phoropter use, to determine the correct prescription for patients.	**BT 3**
CO 4	**Analyse** objective and subjective clinical refraction.	**BT 4**

SYLLABUS:THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Ophthalmic Case Historian: Demographic data, chief complaints, secondary complaints, ocular history, medical history, drugs and medications, family ocular history, family medical history, social history, review of system, few example of history writing. 2. Recording Visual Acuity: Distance – Snellens and log MAR. near-points/'M'/RS, use of Baily-lovie word reading chart.	**9**
2	Objective Refraction: Streak Retinoscopy – all procedures to use streak retinoscope; static and dynamic retinoscopy, different methods of dynamic retinoscopy – MEM, Nott's, Sheard's, Low and high neutral, Bells, Cross, Taits. Other methods of retinoscopy- Radical, Near(Mahandra), Chromoretinoscopy, String Lensbar, use of objective and autorefractor.	**9**
3	Subjective Refraction: Monocular Distance – Classic fogging, testing of astigmatism under fog fixed astigmatic dial (clock dial), rotary astigmatic dial, combination of fixed and rotary dial (Fan and Block test), J.C.C. Duochrome or Bichrome, Binocular balancing – alternate occlusion, prism dissociation, dissociated duochrome balance, Borish dissociated fogging, equalization	**9**

4	Binocular Distance – T.I.B. (Turville Infinity Balance), Polarized – Target and polarized filter, fogging. Near subjective refraction. Cycloplegic refraction, cycloidemia, sudden unfogging , Borish delayed spherical end point, pinhole estimation of refractive error, stenopaic slit refraction, measurement of vertex distance, distometer, use of subjective autorefractor. Different methods of measuring amplitude of accommodation. Correction of Presbyopia – Different methods of stimulation of tentative presbyopic addition – amplitude of accommodation, J.C.C., NRA-PRA balance, Bichrome, Plus Build-up, based on age, Dynamic retinoscopy. Occupational consideration, finalization of odd for near and intermediatedifferent options of correction. Measurement of IPD and significance. Final discussion with the patient. Writing prescription of power and counseling	**9**
	TOTAL	**36**

SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	History writing Recording VA	**6**
2	Practice of Streak Retinoscopy Direct Opthalmoscopy-Normal Fundus	**6**
3	Subjective refraction – fogging, clockdial, fan, JCC, prism balance, TIB, duochrome, cyclodeimia, Slit refraction Measurement of amplitude of accommodation.	**6**
4	Presbyopic add Writing prescription	**6**
	TOTAL	**24**

TEXT BOOK:

1. Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinemann, 2007
2. David B. Elliot: Clinical Procedures in Primary Eye care, 3rd edition, Butterworth – Heinemann, 2007
3. WJ Benjamin: Borish's clinical refraction,2nd edition, Butterworth Heinemann, Missouri, USA,2006

4. SYLLABUS (4TH SEM)

DSE PAPER II /SUBJECT NAME: CLINICAL EXAMINATION OF THE VISUAL SYSTEM
SUBJECT CODE: OPT242D402

SCHEME OF EVALUATION: (T) **L-T-P-C:4-0-0-4**

Total credits: 4

Course Objective: This course covers various clinical optometry procedures involving external examination, anterior segment and posterior segment examination, neuroophthalmic examination, paediatric optometry examination, and Glaucoma evaluation.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Understand** the anatomy and physiology of the visual system	**BT 1**
CO 2	**know** the purpose, set-up and devices required for the test, indications and contraindications of the test, step-by-step procedures, documentation of the findings, and **interpret** the findings of the various clinical optometry procedures	**BT 2**
CO 3	**Demonstrate** the ability to conduct standard visual assessments such as visual acuity tests, refraction, and fundoscopy.	**BT 3**
CO 4	**Identify** and differentiate between common visual disorders (e.g., myopia, hyperopia, cataracts, glaucoma) based on clinical signs and patient symptoms.	**BT 4**

SYLLABUS:THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	History taking Visual acuity estimation Extraocular motility, Cover teat, Alternating cover test Hirschberg test, Modified Krimsky Pupils Examination	**12**
2	Maddox Rod Van Herrick External examination of the eye, Lid Eversion Schirmer's, TBUT, tear meniscus level, NITBUT (keratometer)	**12**
3	Color Vision Stereopsis Confrontation test Photostress test Slit lamp biomicroscopy Ophthalmoscopy	**12**
4	Tonometry ROPLAS Amsler test Contrast sensitivity function test Saccades and pursuit test	**12**
	TOTAL	**48**

TEXT BOOK: T Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinneman, USA, 2007.

SYLLABUS (4TH SEM)

SEC PAPER /SUBJECT NAME: OPHTHALMIC LENS & DISPENSING OPTICS PRACTICAL

SUBJECT CODE: OPT242S411

SCHEME OF EVALUATION: (P) **L-T-P-C:0-0-4-2**

Total credits: 2

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and define key terms and basic principles associated with the field of dispensing optics, including types of lenses, frame materials, and optical measurements.	**BT 1**
CO 2	**Describe** the basic principles of light, refraction, and lens design that are essential in dispensing optics.	**BT 2**
CO 3	**Utilize** various optical instruments and techniques to measure and fit eyewear accurately.	**BT 3**
CO 4	**Compare** and **contrast** different types of corrective lenses, including single vision, bifocals, trifocals, and progressive addition lenses, in terms of their design and intended use.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Find out the menidean & optical center of ophthalmic lens Neutralization – manual & help of lensometer Identification of lens-spherical, cylindrical & spheno-cylindrical lenses	**6**
2	Lens-surfacing & edging, cutting & marking of single vision bifocal progressive Frame measurement: The boxing system, the datum system. Comparison of the two systems, Lens position, segment specification	**6**
3	Frame selection: Fashion, function & standard alignment Lens selection : Ground rule for selection, selection criteria	**6**
4	Facial measurements: The PD, Visual axes, & measuring inter-pupillary distance using P.D ruler. Common difficulties in measuring P.D , Measuring monocular P.D, measuring near C.D. Measuring heights :- single vision , bifocal, multifocal, progressive Pediatric dispensing	**6**
	TOTAL	**24**

SYLLABUS (4TH SEM)

GE – 1 PAPER /SUBJECT NAME: VISUAL OPTICSII

SUBJECT CODE: OPT242G401

SCHEME OF EVALUATION: (T) **L-T-P-C:3-0-0-3**

Total credits: 3

Course Objective:

The objective of the course is to make the students familiar with the concept of eye as an optical instrument and thereby cover different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	To **apply** the fundamentals of optical components of the eye	**BT 1**
CO 2	**Explain** the concepts of aberrations, including spherical and chromatic aberrations, and their impact on visual acuity.	**BT 2**
CO 3	**Utilize** optical design software to simulate and optimize optical systems for vision correction, such as contact lenses and intraocular lenses.	**BT 3**
CO 4	**Compare** and **contrast** various types of advanced ophthalmic instruments such as autorefractors, corneal topographers, and aberrometers, highlighting their applications and limitations.	**BT 4**

SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Correction of ametropia Correction of myopia- spectacle refraction (F) – ocular refraction(K) – Relationship between F and K. correction of hypermetropia- the effect of vertex distance change. Correction of ametropia with Thick lenses. Some problems involving K.	**9**
2	Clear and blurred images in the reduced and simplified schematic eyes. The visual axis. Pupil size and blur disc diameter. Depth of field . retinal image size in uncorrected reduced eye. Spectacle magnification in reduced and corrected eyes. Nodal points and clear image size. Retinal images with a near object. Spectacle magnification in near vision. The simple magnifier. Relative spectacle magnification. Correction of spherical ampetropia with contact lens. Spectacle magnification with a contact lens. Ammetropia in the actual human eye. The growth of the human eye in emmetropia. Spherical ametropia in adult eye. Genetic aspects of refractive error. Summary of the causative factors involved in ametropia . Progressive myopia. Juvenile stress myopia.	**9**
3	Aphakia. Reflective error in aphakia. The retinal image size in aphakia. Correction of aphkia by a contact lens. Use of an intracocular implant. Power of the implant and retinal image size. Clinical aspects of aphakia. Astigmatism: Oblique astigmatism. Astigmatism in the reduced eye. Th retinal images of point and extended objects. Classification of astigmatism. Correction of astigmatism by sphero- cylindrical, toric and contact lenses. Retinoscopy – principle and use. Clinical recording of standard of vision-visual acuity.	**9**
4	Review of subjective refractive methods. Problem of review of objective refractive methods Crosscylindrical method of detecting astigmatism Eye as an imaging instrument. Schematic eyes. Diffraction and the eye. Image formation in wave optics. Aberrations of the lens and cornea. Chromatic aberration of the eye. Optical performance of the eye. Total performance of the eye. Variation of visual performance with focus. Contrast sensivity of the eye.	**9**
	TOTAL	**36**

Textbook:

1. Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinemann, 2007

2. Duke–Elder's practice of Refraction

SYLLABUS (5TH SEM)

CORE PAPER – 1 /SUBJECT NAME: BINOCULAR VISION AND OCULAR MOTILITY
SUBJECT CODE: OPT242C501

SCHEME OF EVALUATION: (T) **L-T-P-C:4-0-0-4**
Total Credits : 4

Course Objective: This course provides theoretical aspects of Binocular Vision and its clinical application. It deals with basis of normal binocular vision and space perception, Gross anatomy and physiology of extraocular muscles, various binocular vision anomalies, its diagnostic approaches and management.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Remember** the structures involved in binocular vision including the retina, optic nerve, extraocular muscles, and visual pathways.	**BT 1**
CO 2	**Demonstrate** an in-depth knowledge of the gross anatomy and physiology relating to the extraocular muscles.	**BT 2**
CO3	**Develop** a detailed explanation of, and differentiate between the etiology, investigation and management of binocular vision anomalies.	**BT 3**
CO4	**Analyse** and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	. Grades of binocular vision-simultaneous perception (first grade of binocular vision), fusion, steropsis (third grade of binocular single vision). Advantages of binocular vision. Visual direction and the horopter_visual direction, corresponding point and normal retinal correspondence, horopter, physiologic diplopia. Binocular fusion-panum's area,fixation disparity,theories of binocular fusion,synergy hypothesis of panum,local sign hypothesis of hering,eye movement hypothesis of helmholts,suppession hypothesis of du tour and verhoeff,physiologic basis of fusion.	**12**
2	Dihoptic stimulation-depth with fusion and depth with diplopia,diplopia without depth,retinal rivary and suppretion,binocular lusure. Stropsis-physiologicalbasis of stereopsis,local and global stereopsis and	**12**

	fusion,stereopsis acuity neurophysiology of stereopsis. Depth perception-steropsis,nonstereoscopic cluesto yhe perception of depth under binocular condition,monocular clues (non stereoscopic clues to spetial orientation)-parallactic movements, linear perspectiveoveriay of contours,sizedistance from horizon ,distribution of highlights, shadow, shades and light .aerial perspective ,influence of accommodation and convergence on depth perception, conclusion. Integration of the motor and sensory system into binocular vision.	
3	Binocular defects: Binocular optical defects-anisometropia-vision in anisometropia,treatment, Binocular optical defects-aniseikoniasymtoms , clinical investigatoin,treatment. Binocular muscular co-ordination-orthophoria-binocular vision. Binocular muscular anomalies-heterophoria-the causes of imbalance ,exophoria, esophoria, hyperphoria, cyclophoria, symptoms of heterophoria, treatment. Binocular muscular anomalis-heterotropia—the vision in concomitant strabismus, treatment. Binocular muscular co-ordination-convergence-voluntary and reflex convergence, reflex convergence, the measurement of convergence, the relation between accommodation and convergence, binocular accommodation, fatigue of convergence. Binocular muscular anomalies-anomalies of convergence and other reading difficulties—insufficiency of convergence, convergence excess, the ophthalmologist and the reading ability of children.	**12**
4	BINOCULAR VISION TEST: Test for simultaneous macular perception, test for fusion, test for stereopsis-synoptophore or stereoscope test, vectograph test, titmus stereo test,randomdot sterogram test,simple motor task test based on stereopsis. Eye movements: the orbit anatomy of the extraocular muscles. Interactive dynamics of orbital mechanisms & brain stem neurophysiology – out line of extra ocular muscle control. Extra ocular muscles-their function & nerve supply. Mechanics of actions of extra ocular muscles -cross sectional area of muscle, length of muscle. Arc of contact, muscle plane, Muscle axis of rotation. Physiology of ocular movement – Basic Kinematics, (position of gaze, Fick's axes) Ocular movements - Monocular Movements (Adduction, Abduction, supraduction, Infraduction, Incycloduction, excycloduction). Binocular Movements –VERSIONS- (saccadic & pursuit movement, position maintenance movements, stabilization movements & their characteristics). VERGENCES – (Convergence, divergence, vertical vengeance), Supra nuclear control of eye movements.(the superior colliculi, the occipital cortex, the psycho optical reflexes & fixation. Oculomotor system: vestibular – ocular reflexes, optokinetic reflexes. Diagnosis & clinical aspects of ocular anomalies & disorders.	**12**

	Converge through a spectacle lens. Prismatic effects in spectacle lenses.	
	TOTAL	**48**

TEXT BOOKS:

1. Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

2. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd

3. Gunter K. V. Mosby Company

4. Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers

SYLLABUS (5TH SEM)

CORE PAPER- 2 /SUBJECT NAME: CONTACT LENS I + CONTACT LENS I LAB
SUBJECT CODE: OPT242C502

SCHEME OF EVALUATION: (T+ P) **L-T-P-C = 3-0-2-4**
Total Cedits:4

Course Objective: The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and differentiate between rigid gas permeable (RGP), soft, hybrid, and scleral contact lenses, as well as their respective materials such as silicone hydrogel and hydrogel.	**BT 1**
CO 2	**Understand** the basics of contact lenses & list the important properties of contact lenses	**BT 2**
CO 3	**Apply** contact lens fitting principles to different types of patients, considering factors like corneal curvature, tear film dynamics, and patient lifestyle.	**BT 3**
CO 4	**Analyze** patient characteristics, such as refractive error, corneal shape, and tear film quality, to choose the most suitable contact lens material and design.	**BT 4**

DETAILED SYLLABUS (THEORY):

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Contact lens history & development. Benefits of contact lens over spectacle. Manufacturing	**9**

	methods-spin cast, Lethe cut, Cast modeling. Slit lamp Examination technique Corncal topography- Keratometry & Extended Keratometry	
2	Contact lens optics-Contact lens & spectacle lens. Back vertex calculation. Contact lens & Tear lens system. Classification of contact lens & its material (soft & RGP); Material property. Contact lens terminology. RGP & soft lens design. FDA classification of contact lens material.	**9**
3	Patient selection & prescreening. Indications & contra indications of contact lens. Soft spherical contact lens fitting & Assesment. Soft contact lens case & maintenance.	**9**
4	Spherical RGP contact lens fitting & assessment. RGP contact lens care & maintenance.	**9**
	TOTAL	**36**

DETAILED SYLLABUS (PRACTICAL):

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Routine clinical procedure for contact lens patient & selection of contact lens	**3**
2	Keratometry & slit lamp Biomicroscopy.	**3**
3	Spherical soft & Spherical RGP contact lens fitting: selection of contact lens Base curve, diameter & Power & fitting Assessment .	**3**
4	Insertion & Removal of soft & RGP contact lens. Contact lens & maintenance.	**3**
	TOTAL	**12**

TEXT BOOKS:

1. IACLE modules 1 - 10

2. CLAO Volumes 1, 2, 3

3. Anthony J. Phillips : Contact Lenses, 5thedition, Butterworth-Heinemann, 2006

4. Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004

5. E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008

SYLLABUS (5TH SEM)

DSE PAPER- 1 /SUBJECT NAME: LOW VISION AIDS & VISUAL REHABILITATION + LAB
SUBJECT CODE: OPT242D501

SCHEME OF EVALUATION: (T) **L-T-P-C:3-0-2-4**
Total Credits: 4

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**List** common causes of low vision such as macular degeneration, diabetic retinopathy, and glaucoma.	**BT 1**
CO 2	**Explain** the various etiologies and classifications of low vision, including conditions such as macular degeneration, diabetic retinopathy, and glaucoma.	**BT 2**
CO 3	**Utilize** knowledge of visual functioning and psychosocial factors to develop personalized visual rehabilitation strategies tailored to the specific needs and goals of patients with low vision.	**BT 3**
CO 4	**Analyze** the psychological and social consequences of vision loss, including its effects on self-esteem, independence, and social participation, and propose interventions to address these challenges.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Definition-old, new, proposed Grades of low vision Statistics/ Epidemiology Relation between disorder, impairment & handicapped	**12**
2	Low vision optics Magnification-relative distance/ relative size/ approach/angular Optics of Galilean & Keplerian telescope- advantage/disadvantage, significance of exit & entrance pupil. Optics of spectacle magnifier/ determination/ calculation/ disadvantage/advantage.	**12**

	Optics of stand magnifier, significance of equivalent viewing distance & calculations. Telescope- distance/ near/ telemicroscope/ monocular/ binocular/ bioptic. Determination of decentration of lenses /prism/calculation/Lebenson's formula/simple diotric formula. Hand held magnifier-illuminated/ non-illuminated. Spectacle magnifier / half eye/ prism correction/ bar magnifier/ CCTV/ magni-cam/ low vision imaging system or V-max / contact lens & IOL telescope.	
3	Low vision examination: Task/ Goal oriented history-medical/ visual/ psychological history/ task analysis/ mobility/ distance vision/ near vision / daily living/ illumination/ work & school. Visual acuity measurement-distance/ near/ use of log MAR chart (distance & near)/ light house, picture chart/ visual field/ Amsler chart/ contrast sensitivity/ overview of glare testing. Low vision refraction. Assessment & prescription of low vision devices-optical/ non-optical/ rehabilitation services. Non- optical devices-pen/umbrella/ boldline note book/ illumination/ letter writer/ environmental modification/ signature guide/ needle threader/ eccentric viewing strategies.	**12**
4	Overview of Rehabilitation Services:- definition/ implementation/ vocational guidance/ educational guidance/ mobility & orientation training / special teacher/ special school/ Braille system/ integrated system/referral center- activity/ support/ loan. Overview of systematic / retinal diseases in relation to low vision:- acromatopsia/ LMBB syndrome/ labers congenital anomaly/ down syndrome/ retinitis pigmentosa/ diabetic retinopathy/ optic atrophy/ albinism/ aniridia. Counseling of low vision patient/ parents/ guardians/relatives.	**12**
	TOTAL	**48**

TEXT BOOKS:

1. Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth-Heinemann, 1998

2. Sarika G, Sailaja MVSE Vaithilingam: practice of Low vision –A guide book, Medical Research Foundation, 2015

SYLLABUS (5TH SEM)

DSE PAPER-II /SUBJECT NAME: OCULAR DISEASE II
SUBJECT CODE: OPT242D502

SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total Credits: 4

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Identify** and **list** treatment modalities for advanced ocular diseases, including pharmaceutical treatments, surgical options, and lifestyle modifications.	**BT 1**
CO 2	**Describe** the underlying causes and mechanisms of advanced ocular diseases such as glaucoma, macular degeneration, diabetic retinopathy, and uveitis.	**BT 2**
CO 3	**Utilize** advanced diagnostic tools and techniques such as optical coherence tomography (OCT), fluorescein angiography, and electrophysiology in diagnosing and monitoring ocular diseases.	**BT 3**
CO 4	**Differentiate** between the clinical signs, symptoms, and diagnostic test results of various advanced ocular diseases.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Diseases of the Vitreous Humor- Congenital Anomalies. Vitreous Opacities. Hereditary Vitreo – Retinal Degeneration's. Vitreous Haemorrhage .Detachment of Vitreous Humor . Vitreous Surgery . Methods of clinically assessing the posterior segment (direct & indirect opthalmoscopy) Disease of the Retina- Congenital & Dev. Defects. Inflammation of the Retina(Retinitis) . Retinal Vasculitis . Oedema of the Retina. Haemorrhage of the Retina. Vascular Occlusion . Retinal Arteriosclerosis. Retinopathies . Retinal Telangiectasis. Degeneration's of the Retina. Detachment of the Retina. Surgical Procedures for Retinal Detachment .Tumours of the Retina. Phakomatoses,. Injuries of the Retina. Disease of the Optic Nerve- Congenital Anomalies. Papilloedema. Inflammation of the Optic Nerve(Optic- Neuritis). Ischaemic Optic Neuropathy . Optic Atrophy. Tumours of the Optic Nerve. Injuries of the Optic Nerve. Symptomatic Disturbances of Visual Function – Visual Field Defects . Amblyopia. Amaurosis. Night Blindness. Day Blindness. Defects in Color Vision. Congenital Word Blindness. Malingering.	**12**
2	Neuro –eye disease: Evaluation of optic nerve disease	**12**

	Clinical features of optic nerve dysfunction., Optic disc changes. Optic atrophy. Special investigation. Classification of optic neuritis Optic neuritis and demyelination Systemic features of multiple sclerosis, Special investigation. Optic neuritis. Other causes of optic neuritis Parainfectious optic neuritis. Infectious optic neuritis. Non-arteritic anterior ischaemic optic neuropathy Arteritic anterior ischaemic optic neuropathy Clinical features of giant cell arteritis. Special investigation. Arteritic anterior ischaemic optic neuropathy. Leber hereditary optic neuropathy Hereditary optic atrophies Kjer syndrome. Behr syndrome. Wolfram syndrome. Alcohol-tobacco amblyopia Drug-induced optic neuropathies PAPILLOEDEMA Raised intracranial pressure - Causes.Hydrocephalus. Systemic features. Clinical features of papilloedema Differential diagnosis.	
3	CONGENITAL OPTIC NERVE ANOMALIES Without neurological associations Tilted disc. Optic disc drusen. Optic disc pit. Myelinated nerve fibers. With neurological associations Optic disc coloboma. Morning glory anomaly. Optic nerve hypoplasia. Aicardi syndrome. Miscellaneous anomalies. PUPILLARY REACTION Applied anatomy. Abnormal pupillary reactions Afferent pupillary conduction defects Argyll robertson pupils Differential dignosis of light-near dissociation Adie pupil oculosympathetic palsy (horner syndrome) NYSTAGMUS Classifications Causes Physiological nystagmus. Motor imbalance nystagmus. Ocular nystagmus. nystagmoid movements. SUPRANUCLEAR DISORDER OF EYE MOVEMENTS Conjugate eye movements Saccadic movements. Smooth pursuit movements. Non-optical reflexes. Supranuclear gaze palsies Horizontal gaze palsies.	**12**

	Vertical gazepalsies.	
4	THIRD NERVE DISEASE Applied anatomy Clinical aspects Clinical features. Aberrant regeneration. Causes isolated third nerve palsy. FOURTH NERVE DISEASE Applied anatomy Clinical aspects Clinical features. Causes of isolated fourth nerve palsy. SIXTH NERVE DISEASE Applied anatomy Clinical aspects Clinical features. Causes. DISORDERS OF CHIASM Classification Applied anatomy Applied physiology Hyperpituitarism. Hypopituitarism. Pituitary adenoma Clinical features. Special investigation. Treatment. Craniopharyngioma Meningioma DISORDERS OF RETROCHIASMAL PATHWAYS AND CORTEX Clinical features of optic tract lesion Lesions of optic radiations Applied anatomy. clinlcal features. Lesions of striate calcarine cortex Migraine Clinical features Management OCULAR MYOPATHIES AND RELATED DISORDERS Myasthienia gravis Clinical features. Special investigations. Treatment. Ocular myopathies Myotonic dystrophy Systemic features. Ocular features. Essential blepharospasm Clinical features. Treatment. NEUROFIBROMATOSIS Neurofibromatosis type-1(NF-1) Systemic features. Ocular features. Neurofibromatosis type-2(NF-2)	**12**

	TOTAL	**48**

SYLLABUS (5TH SEM)

DSE PAPER-II /SUBJECT NAME: GERIATRIC OPTOMETRY
SUBJECT CODE:

SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total Credits: 4

Course Objective: This course deals with general and ocular physiological changes of ageing, common geriatric systemic and ocular diseases, clinical approach of geriatric patients, pharmacological aspects of ageing, and spectacle dispensing aspects in ageing patients.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** and **describe** common age-related ocular conditions and diseases such as cataracts, glaucoma, macular degeneration, and diabetic retinopathy.	**BT 1**
CO2	**Explain** the physiological and anatomical changes in the aging eye and their impact on vision.	**BT 2**
CO3	**Utilize** advanced diagnostic techniques and technologies in the assessment and management of geriatric patients.	**BT 3**
CO 4	**Examine** the psychological impact of vision loss on elderly patients and the social implications, including the effect on independence and quality of life.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Structural , and morphological changes of eye in elderly Physiological changes in eye in the course of aging. Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders, vascular diseases of the eye	9
2	Introduction to geriatric medicine – epidemiology , need for optometry care, systemic diseases (Hypertension, Atherosclerosis, coronary heart disease, congestive Heart failure, Cerebrovascular disease, Diabetes, COPD) Optometric Examination of the Older Adult	9
3	Contact lenses in elderly Pharmacological aspects of aging	9
4	Low vision causes, management and rehabilitation in geriatrics Spectacle dispensing in elderly – Considerations of spectacle lenses and frames	9
	TOTAL	36

TEXT BOOKS:

1. OP Sharma: Geriatric Care –A textbook of geriatrics and Gerontology, viva books, New Delhi, 2005

2. VS Natarajan: An update on Geriatrics, Sakthi Pathipagam, Chennai, 1998

3. DE Rosenblatt, VS Natarajan: Primer on geriatric Care A clinical approach to the older patient, Printers Castle, Cochin, 2002

SYLLABUS (6TH SEM)

CORE PAPER I /SUBJECT NAME: APPLIED OPTOMETRY & ORTHOPTICS + LAB
SUBJECT CODE: OPT242C601

SCHEME OF EVALUATION: (T+P) **L-T-P-C: 3-0-2-4**
Total credits: 4

Course Objective: This course deals with understanding of strabismus, its classification, necessary orthoptic investigations, diagnosis and non-surgical management. Along with theoretical knowledge it teaches the clinical aspects and application

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Recognize** and **name** common ocular disorders, such as strabismus, amblyopia, and refractive errors, along with their associated symptoms	**BT 3**
CO 2	**Explain** the steps and importance of various orthoptic assessments, including cover tests, prism bar tests	
CO 3	**Apply** knowledge of different types of strabismus, its etiology signs and symptoms, necessary investigations and management.	**BT 3**
CO 4	**Compare** and **contrast** the accuracy and appropriateness of various diagnostic tools and techniques, such as visual acuity tests, refraction assessments, and ocular motility evaluations.	**BT 4**

DETAILED SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	ORTHOPTIC INSTRUMENTS Prism Bar Synoptophore Maddox Wing Maddox Rod Red Green Goggles Hess Screen Risley Prisms	**9**
2	Investigative procedures Motor signs in squint A) Head position: Face turn, chin position, Head tilt. B) Cover test & cover-uncover tests C) Maddox wing to assess heterophoria. Assessment of degree of squint a) Hirschbag test. b) Prism bar test.	**9**

	c) Krimskey test d) Synoptophore test Assessment of ocular motality status a) Hess chart b) Diplopia testing c) Bielschowskys Head tilting test Assessment of visual sensory status in squint. Amblyopia Suppression Binocular single vision – SMP, Fusion, Stereopsis. Mechanisms leading to squint Types of squint – a) latent / manifest b) horizontal / vertical c) paralytic / concomitant	
3	Orthoptic Treatment Procedures Management of – Convergence insufficiency Amblyopia Suppresion ARC Use of prism - For Exercise & correction	**9**
4	AMBLYOPIA Definition. Neuropathology. Classification. Clinical Features. Treatment. a) Occlusion. b) Penalisation. c) Role of drugs	**9**
	TOTAL	**36**

DETAILED SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Demonstration of following Orthoptic instruments/methods and their uses – Prism Bar Synoptophore Maddox Wing Maddox Rod Red Green Goggles RAF Gauge	**3**
2	Cover test Hirschberg test Krimsky test Diplopia charting Visuoscopy Accommodative flipper	**3**
3	Orthoptic Investigative & Therapeutic Procedure	**3**

4	Case records AND Case Handling	**3**
	TOTAL	**12**

SYLLABUS (6TH SEM)

CORE PAPER II /SUBJECT NAME: CONTACT LENS II + LAB
SUBJECT CODE: OPT242C604

SCHEME OF EVALUATION: (T+P) **L-T-P-C: 3-0-2-4**
Total credits: 4

Course Objective: The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**

CO 1	**List** and **describe** the basic materials used in the manufacture of contact lenses and the design principles that enhance comfort and visual acuity.	**BT 1**
CO 2	**Understand** the basics of contact lenses & finalise the CL design for various kinds of patients	**BT 2**
CO 3	**Identify** and manage the adverse effects of contact lens	**BT 3**
CO 4	**Differentiate** between various types of specialty contact lenses (e.g., toric, multifocal, orthokeratology) and analyze their fitting techniques based on patient-specific ocular conditions.	**BT 4**

DETAILED SYLLABUS: THEORY

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Contact lens fitting in astigmatism. Contact lens fitting in keratokonus. Contact lens fitting in children. RGP lenses – low D.K. and high D.K. lenses.	**9**
2	Instructions regarding handling and care of lenses. Cosmetic and prosthetic contact lenses. Extended wear lenses versus Daily wear Disposable lenses	**9**
3	Contact lens – Toric, Bifocal, Multifocal. Therapeutic lenses / Bandage lenses. Contact lens solutions – principle of action, compositions Ordering contact lenses – writing prescription to the lab.	**9**
4	Contact lens – modifications of finished lenses (RGP). Checking the parameters. Recent advances in contact lenses. Follow up examinations Contact lens complications and their management. Prosthetic eye fitting procedures & conformers.	**9**
	TOTAL	**36**

DETAILED SYLLABUS: PRACTICAL

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Fitting and assessment of contact lenses – steep, flat, optimum on spherical cornea	**3**

2	Fitting and assessment of contact lenses – steep, flat, optimum on toric cornea with spherical lenses.	**3**
3	Fitting and assessment of contact lenses – steep, flat, optimum on toric cornea with toric lenses.	**3**
4	Teaching the patient to insert and remove contact lenses. Writing Contact Lens prescriptions	**3**
	TOTAL	**12**

SYLLABUS (6TH SEM)

DSE PAPER I /SUBJECT NAME: SYSTEMIC CONDITION & THE EYE
SUBJECT CODE: OPT242D601

SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total credits: 4

Course Objective: This course deals with definition, classification, clinical diagnosis, complications and management of various systemic diseases. In indicated cases ocular manifestations also will be discussed.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**

CO 1	**List** the ocular signs and symptoms associated with systemic conditions like diabetic retinopathy, hypertensive retinopathy, and thyroid eye disease.	**BT 1**
CO 2	**Demonstrate** a strong understanding of common systemic diseases	**BT 2**
CO 3	**Plan** the most appropriate treatment for their patient	**BT 3**
CO 4	**Distinguis**h ocular manifestations of common systemic diseases	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Arterial Hypertension i) Pathophysiology, classification, clinical examination, diagnosis, complications, management. ii) Hypertension and the eye. Diabetes mellitus i) Pathophysiology, classification, clinical features, diagnosis, complications, management. ii) Diabetes mellitus and the eye. Acquired Heart Disease – Embolism i) Rheumatic heart disease ii) Subacute bacterial endocarditis. iii) Heart disease & the eye	**12**
2	Malignancy i) Definitions, nomenclature, characteristics of benign & malignant neoplasms. ii) Grading and staging of cancer, diagnosis, priniples of treatment. iii) Neoplasia and the eye. Connective Tissue Disease i) Anatomy and pathophysiology: Arthritis. ii) Eye and connective tissue disease. Thyroid Disease i) Anatomy and physiology of the thyroid gland. ii) Classification of thyroid disease	**12**

	iii) Diagnosis, complications, clinical features, management of thyroid disease involving eye.	
3	Tuberculosis i) Etiology, pathology, clinical features, pulmonary TB, diagnosis, complications, treatment of tuberculosis involving the eye. Tropical Disease and the Eye i) Leprosy. ii) Syphilis. iii) Malaria. Vitamin deficiency and the eye	**12**
4	Neurological disease and the eye i) Classification of neurological diseases. ii) Demyelinating diseases iii) Visual pathway lesions iv) Papiloedema. Genetic disorders and the eye. Phacomatoses & the eye	**12**
	TOTAL	**48**

TEXT/ REFERENCE BOOKS:

1. Clinical Ophthalmology: Jack J Kanski

2. C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles and Practice of Medicine, Ed. John Macleod, 19th Ed., ELBS/Churchill Livingstone. (PPM), 2002

3. Basic and clinical Science course: Update on General Medicine, American Academy of Ophthalmology, Section 1, 1999

SYLLABUS (6TH SEM)

DSE PAPER II /SUBJECT NAME: PUBLIC HEALTH & COMMUNITY OPTOMETRY
SUBJECT CODE: OPT242D602

SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total credits: 4

Course Objective: Introduction to the foundation and basic sciences of public health optometry with an emphasis on the epidemiology of vision problems especially focused on Indian scenario.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	**Define** the role and responsibilities of optometrists in promoting community health.	**BT1**
CO 2	**Explain** the fundamental principles of public health and how they apply to community optometry practices.	**BT2**

CO3	**Apply** the principles of screening in the community for the diagnosis of visual disorders	**BT3**
CO4	**Examine** the distribution and determinants of eye diseases in different populations and communities.	**BT4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Concept of public health. Principles of primary, secondary and tertiary care.	**12**
2	Planning of health services. Health economics	**12**
3	Health manpower development-a)Basic O.T Practices b) Familiarity with use of Operating Microscope NPCB and refractive blindness – optometrist's role as primary health care provides	**12**
4	Health cares insurance including role of TPA. Ocular emergencies – a) Foreign body b) Eye Pain c) Watering d) Injuries-perforating, non perforating & chemical	**12**
	TOTAL	**48**

SYLLABUS (6TH SEM)

DSE PAPER III /SUBJECT NAME: BIOSTATISTICS
SUBJECT CODE: OPT242D603
SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total credits: 4

Course Objective: The objective of this module is to help the students understand the basic principles of research and methods applied to draw inferences from the research findings.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Identify** basic biostatistical terms and concepts such as mean, median, mode, variance, standard deviation, population, sample, and probability	**BT1**
CO2	**Understand** and interpret commonly reported statistical measures published in healthcare research	**BT2**
CO3	**Use** statistical software to conduct descriptive and inferential statistical analyses on biological data sets.	**BT3**

CO4	**Apply** various biostatistical methods (e.g., t-tests, chi-square tests, ANOVA, regression analysis) to interpret data from biomedical research studies.	**BT 4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Introduction about Biostatistics, variables, data, population sample, parameter statistics, scales of measurement. Classification & Presentation of data: Frequency distribution, Frequency polygon, Bar diagram, Histogram, Frequency distribution curve, CF & CP, Ogive, Percentile & Quartiles.	**12**
2	Descriptive statistics: Statistics of location, Mean Median Mode, Geometric mean, Range, Statistics of Dispersion, Mean Deviation, Standard Deviation, Coefficient of Variation. Correlation & Regression. Sampling Statistics: Sampling & Sampling Distribution, Sampling Errors & sampling statistics, Standard errors, Degree of freedom, Types of Sampling.	**12**
3	Probability Distribution: Classical definition, Conditional probability, Probability in continuous, Joint distribution of random variables. Experimental Design: Controlled and uncontrolled experiment, Sampling types, Sample size & pilot experiment, Single factor experiment & Factorial experiment-example, Analysis of variance (ANOVA).	**12**
4	Applications: Collection, presentation and analysis of hospital statistical data with examples. Collection, presentation and analysis of Optometric and ophthalmologic data with a few examples	**12**
	TOTAL	**48**

TEXT BOOKS:

1. Mausner & Bahn: Epidemiology-An Introductory text, 2nd Ed., W. B. Saunders Co.

2. Richard F. Morton & J. Richard Hebd: A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.

3. Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

SYLLABUS (6TH SEM)

DSE PAPER IV /SUBJECT NAME: OCCUPATIONAL OPTOMETRY AND LAW AND OPTOMETRY
SUBJECT CODE:

SCHEME OF EVALUATION: (T) **L-T-P-C: 4-0-0-4**
Total credits: 4

Course Objective: This course deals with general aspects of occupational health, Visual demand in various job, task analysing method ,visual standards for various jobs , occupational hazards and remedial aspects through classroom sessions and field visit to the factories

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**List** the primary responsibilities and roles of optometrists in occupational health settings.	**BT1**
CO2	**Describe** the key principles of visual ergonomics and their importance in enhancing workplace productivity and safety.	**BT2**
CO3	**Demonstrate** the ability to assess and address the visual demands of various occupations, recommending appropriate visual aids and ergonomic adjustments.	**BT3**

CO4	**Examine** case studies to determine how different occupational hazards affect visual health and performance, proposing preventive and corrective measures.	**BT4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Introduction to Occupational health, hygiene and safety, international bodies like ILO, WHO, National bodies etc. Acts and Rules - Factories Act, WCA, ESI Act. Electromagnetic Radiation and its effects on Eye Light – Definitions and units, Sources, advantages and disadvantages, standards	**12**
2	Color – Definition, Color theory, Color coding, Color defects, Color Vision tests Occupational hazards and preventive/protective methods Task Analysis	**12**
3	Industrial Vision Screening – Modified clinical method and Industrial Vision test Vision Standards – Railways, Roadways, Airlines Visual Display Units Contact lens and work	**12**
4	Professionalism and Values Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality Personal values- ethical or moral values Attitude and behaviour- professional behaviour, treating people equally Medical ethics - Definition - Goal - Scope b Introduction to Code of conduct Basic principles of medical ethics –Confidentiality Malpractice and negligence - Rational and irrational drug therapy Autonomy and informed consent - Right of patients	**12**

	TOTAL	**48**

TEXTBOOKS:

1. PP Santanam, R Krishnakumar, Monica R. Dr. Santanam's text book of Occupational optometry. 1st edition, Published by Elite School of optometry , unit of Medical Research Foundation, Chennai, India , 2015

2. R V North: Work and the eye, Second edition, Butterworth Heinemann, 2001

SYLLABUS (6TH SEM)

SEC PAPER/SUBJECT NAME: INDIAN TELEMEDICINE
SUBJECT CODE: OPT242C605
SCHEME OF EVALUATION: (T) **L-T-P-C: 2-0-0-2**
Total credits: 2

Course Objective: This course insight into existing healthcare system in India.

Course Outcome:

On successful completion of the course the students will be able to:		
SI No	**Course Outcome**	**Blooms Taxonomy Level**
CO1	**Recall** the fundamental principles, technologies, and infrastructure necessary for telemedicine in the Indian healthcare system.	**BT1**
CO2	**Summarize** the legal frameworks, ethical guidelines, and privacy concerns specific to telemedicine in India.	**BT2**
CO3	**Demonstrate** the application of telemedicine protocols in diagnosing, treating, and monitoring patients remotely in different medical specialties.	**BT3**
CO4	**Examine** the impact of telemedicine on healthcare access, quality, and outcomes in rural versus urban areas in India, identifying key advantages and obstacles.	**BT4**

DETAILED SYLLABUS:

MODULE	TOPICS & COURSE CONTENT	PERIODS
1	Healthcare delivery system in India at primary, secondary and tertiary care Community participation in healthcare delivery system	**6**

	Health system in developed countries. Private Sector National Health Mission National Health Policy Issues in Health Care Delivery System in India Negligence.	
2	National Health Programme-Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.	**6**
3	Health scenario of India- past, present and future Demography & Vital Statistics- Demography – its concept Vital events of life & its impact on demography Significance and recording of vital statistics Census & its impact on health policy	**6**
4	Epidemiology Principles of Epidemiology Natural History of disease Methods of Epidemiological studies Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.	**6**
	TOTAL	**24**