

SHRI GURU RAM RAI UNIVERSITY

[Estd. by Govt. of Uttarakhand, vide Shri Guru Ram Rai University Act no. 03 of 2017 & recognized by UGC u/s (2f) of UGC Act 1956]



SYLLABUS FOR

Bachelor of Optometry

With CO, and PO Mapping

School of Paramedical Sciences

(W.E.F 2021-2022)

Bachelor Optometry

OUTCOME BASED EDUCATION

Programme outcome (POs)

Students will be able to

PO 1	Acquire knowledge to perform the ability to diagnose and manage various vision Abnormalities including refractive errors as well as various eye diseases
PO2	Demonstrate the application abilities Developing the ability to practice various sub-specialities of Eye care Industry like contact lens, spectacle dispensing, orthoptics, low vision management
PO3	Design and Development of basic skills on environmental consciousness and society & community eye concerns in achieving the goal of vision for all..
PO4	Develop an understanding to conduct investigation of complex problems.
PO5	Demonstrate an understanding of learning to upgrade one-self with eye care innovations
PO6	Developing and applying computer skills in eye care system and taking entrepreneurial decisions
PO7	Applying systematized problem-solving techniques to identify and correct procedural errors to verify the accuracy of ophthalmic diagnosis obtained
PO8	Demonstrate the application abilities regarding eye tests to determine the ocular problems and explain their clinical significance and pathophysiology
PO9	Individual and Team Work : Extend the concepts of the ability to communicate effectively both with the patients as well as with in the organization for effective team work
PO10	Assist the student to learn to maintain collaborative relationship with the members of other disciplines to improve health care
PO11	Implement and follow standard protocols while doing various Work effectively in teams to develop national programs for the prevention of blindness
PO12	Maintenance : Application of advanced technical skills to make appropriate and effective on-the-job professional decisions. Performance and interpretation of commonly employed procedures in the ophthalmology department.

SHRI GURU RAM RAI UNIVERSITY DEHRADUN (UTTARAKHAND)

**REGULATIONS OF THE UNIVERSITY FOR THE AWARD OF THE DEGREE OF
BACHELOR OF OPTOMETRY**

In exercise of the powers conferred by section of the SGRR University Act no.3 of 2017.Academic Council of the Shri Guru Ram Rai University Dehradun hereby makes the following regulations:-

SHORT TITLE AND COMMENCEMENT

- (1) These regulations shall be called “THE REGULATIONS FOR THE BACHELOR OF SCIENCE IN MEDICAL RADIO & IMAGING TECHNOLOGY OF THE SHRI GURU RAM RAI UNIVERSITY, DEHRADUN”.
- (2) They shall come into force from the 2019-2020 academic sessions.
- (3) The regulations framed are subject to modification from time to time by the sending them to the Academic Board of the University.

**ADMISSION, SELECTION, MIGRATION AND TRAINING
ADMISSION TO THE B.Sc, OPTOMETRY COURSE.**

‘ELIGIBILITY CRITERIA’

No Candidate shall be allowed to be admitted to the B.Sc Optometry (BOPTO) until:-

- 1) He/She has completed the age of 17 years on or before first day of July of the year commencing the prescribed academic session of the said course;
- 2) He/She has passed qualifying examination as under:
 - a) The Indian school Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years study comprising of Physics, Chemistry, Biology or Mathematics or any other elective subject with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and training after the introduction of the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;

OR
 - b) The Intermediate examination in science of an Indian University/Board or other recognized examine body with Physics, Chemistry, Biology /Maths which shall include a practical test in these subjects and also English as a compulsory subject.

OR
 - c) The pre-professional or medical examination with Physics, Chemistry and Biology after passing either the higher Secondary school examination, or the pre-university or an equivalent examination. The pre-professional/pre-medical examination shall include a practical test in physics, Chemistry and Biology/and also English as a compulsory subject.

OR
 - d) The first year of the three years degree course of recognized University, with Physics, Chemistry and Biology/ including a practical test in these subject provided the examination is a ‘University Examination’ and candidate has passed 10+2 with English at al level not less than a core course;

OR
 - e) B.Sc examination of an Indian University, provided that he/she has passed the B.Sc examination with not less than two of the following subjects-Physics, Chemistry (Botany, Zoology) and further that he/she has passed the earlier qualifying examination with the following subjects Physics, Chemistry/Biology and English (10+2 level);

OR
 - f) Any other examination which in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including a practical test in each of these subjects and English.

OR

10+2 with vocational training in optometry are also eligible.

MIGRATION/TRANSFER OF CANDIDATE

- a) Migration/ Transfer of candidate from one recognized institution to another institution of this University or from another University will not generally be considered.
- b) However, under extra ordinary circumstances, the Vice –Chancellor shall have the power to place any migration/ transfer he deems fit I the Governing Council and get its approval for grant of permission for migration/ transfer to candidates to candidates undergoing course of study in affiliated institutes of this university.

TRAINING PERIOD AND TIME DISTRIBUTION

- 1) The course of BOPTO shall be Threeacademic yearsincluding 1 year compulsory internship. The practical training should be in a150 bedded hospital with minimum patients occupancy of 75%. A part from practical training in non-clinical subjects, the students shall also undergo practical training in the said hospital equipped with Eye opd, Eye ward & Eye OT in Deptt. of Ophthalmology of the said hospital.
- 2) The period of Three years is divide into phase as follows:-
 - (a) **Phase 1 First year B.Sc Optometry (BOPTO) (One Year duration)**
 - i) Human Anatomy& physiology **BSO-101**
 - ii) Ocular Anatomy, Pathology & microbiology **BSO-202**
 - iii) Ocular physiology & biochemistry including binocular reflexes and its maintainance**BSO-103**
 - iv) Optics **BSO-104**

(b) Phase II- Second Year B.Sc Optometry(BOPTO) (One Year duration)

- I. Pharmacology & Pharmacy **BSO-201**
- II. Refraction (including prescription making & fitting of glasses. **BSO -202**
- III. Investigation ophthalmology **BSO-203**
- IV Ophthalmic Instruments & appliances**BSO-204.**

(c) Phase III- Third Year B.Sc Optometry (BOPTO) (One Year Duration)

- I. Clinical advance optics & orthoptics. **BSO-301**
- II. Clinical refraction & contact lens. **BSO-302**
- III. Community ophthalmology & eye bank.**BSO-303**
- IV. Investigation in clinical ophthalmology. **BSO-304**

(d) Phase IV One year compulsory internship in a 150 bedded indoor hospital.

Compartments / Supplementary/ Back Paper:

(I) A student who obtain 40% of the marks individually Including Internal but has failed in twopapers shall be permitted to appear in those papers only at the two consecutive examination and if he/she passes at either of those examination he/she will be deemed to have passed the examination and will be promoted to higher class. (Aggregate marks should be 50%).

(II) A student (s) appearing in back paper/ supplementary shall be Eligible to join the next higherClass provisionally however any student who fails to pass Ist year would not be admitted in 3rd year course.

There shall be one main examination in a year and a supplementary to be held not less than 6 months after publication of its results.

Theory Examination: All the papers in each year carrying 100 marks out of which 30 marks will be internal assessment and 70 marks for external assessment based on the question paper sent by the University the paper will be 3 hrs. Each paper will have 8 questions out of which the candidate will have to attempt 5 questions.

The practical examination will be held with the Final Examination. The practical and Viva voice in each subject will carry 30% marks as internal & 70% marks as external assessment (according to examination scheme) prescribed for the year.

PHASE DISTRIBUTION AND TIMING OF EXAMINATION:

1. Ist Annual Examination at the end of Ist year.
2. 2nd Annual Examination at the end of 2nd year.
3. 3rd Annual Examination at the end of 3rd year.
4. One year Internship after third Annual Examination.

EXAMINATION REGULATIONS

Essentialities for qualifying to appear in professional examinations. The performance in essential components of training to be assessed based on.

ATTENDANCE: 75% of attendance in a subject for appearing in the examination is compulsory provided he/she has 80% attendance in non-lecture teaching i.e. seminars group discussions. Practical in Hospital postings and bedside clinics of 150 bedded indoor hospital with at least 75% patient Occupancy.

INTERNAL ASSESSMENT:

- (a) It shall be based on day today assessment (see note), evaluation of student assignment, preparation for seminar. Clinical case presentation etc.
- (b) Sessional examinations shall be conducted throughout the course. The question of number of examinations is left to the institutions;
- (c) Day to day records should be given importance during internal assessment.
- (d) Weight age for the internal assessment shall be 20% marks of the total marks fixed for internal.
- (e) Student must secure at least 50% marks of the total marks fixed for internal Assessment in Particular subject in order to eligible to appear in final university examination of the subject.

Note: Internal Assessment shall being different ways in which students participation in learning process is evaluated. Some examples are as follows-

- (i) Preparation of subject for student's seminar.
- (ii) Preparation of a clinical case for discussion.
- (iii) Clinical case study problem solving exercise.
- (iv) Participation in projects for health care in the community.
- (v) Proficiency in carrying out a practical or a skill in small research project.
- (vi) Multiple choice questions (MCQ) test after completion of a system/ teaching. Each item tested shall be objectively assessed and recorded. Some of the items can be assigned as home work'/Vacation work.

UNIVERSITY EXAMINATIONS:

Theory Papers will be prepared by examiners as prescribed. Nature of question will be short answer type / objective type and marks for each part indicated separately. Practical/ clinical will be conducted in the laboratories or hospital wards. Objective will be to assess proficiency in skills Conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation.

Viva/ oral includes evaluation of management approach and handling of emergencies Candidate's skills interpretation of common investigative data also is to be evaluated.

The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary for knowledge, skills along with clear concepts of the fundamentals, which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis and practical Question papers should preferably be of short structure/objective type.

Clinical cases/ practical shall take into account common diseases, which the student is likely to come in contact in practice.

During evaluation (both external and internal) it shall be ascertained if the candidate has acquired the skills.-

There shall be one main examination in a year and a supplementary to be held not less than 6 months after publication of its results.

Note: Result of all University Examinations shall be decided before the start of teaching for next session.

DURATION OF EXAMINATION & QUESTIONS

- (i) Each written paper will be attempted.
- (ii) A clinical / practical examination in any subject for student shall not be for more than a day.

GENERAL

If Candidate obtains an aggregate of 75% in all the subjects of any professional Examination, he will be declared to have passed that Examination with Honours, provided he/she passes in all subjects in the first attempt.

INTERNSHIP

General

Internship is a phase of training wherein a graduate is expected to conduct actual practice of Bachelor of optometry acquired skills under supervision so that he/she may become capable of functioning independently.

SPECIFIC OBJECTIVES

At the end of internship training the graduate shall be able to:

- (i) Provide all inclusive training optometry involving all ophthalmic specialist.
- (ii) Optometrist skill like Refraction, effective communication with patient, slit-lamp examination, applanation tonometry and other routine OPD.
- (iii) Patient evaluation and counselling on visual/ocular hygiene .
- (iv) Adequate knowledge to fit, assess, prescribe and dispense contact lenses for refractive correction.
- (v) Be able to assess low vision and provide comprehensive low vision care.
- (vi) Be able to do basic binocular vision assessment, help and co-manage binocular vision anomalies.

INTERNSHIP TIME DISTRIBUTION

Main Objective

Development of skills and competency in prescription of glasses, contact lens and ophthalmic investigations.

Total Period of Internship: 1 year

OTHER DETAILS

- (1) All parts of internship shall be at least 150-bedded hospital & minimum patient occupancy in 75%.
- (2) Every candidate will be required after passing the final B.Sc Optometry, Examination to undergo compulsory rotatory internship to the satisfaction of the college Authorities and University concerned for a period of 1 year so as to be eligible for the award of the degree of Bachelor of Optometry.
- (3) The University shall issue a provisional B.Sc Pass Certificate on passing the final examination after the internship completion on demand by the candidate.

- (4) The intern shall be entrusted with OPD & OT responsibilities under direct Supervision of Senior optometrist & ophthalmologist. They shall not be working independently.
- (5) Interns will not issue certified reports or other related documents under their signature.

ASSESSMENT OF INTERNSHIP

- (1) The interns maintain the record of work, which is to be verified and certified by the Post graduate Optometrist under whom he/she works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation test in knowledge, skills and attitude during and at the end of training. Based on the record of work and date of evaluation the Director / Principal shall issue ‘Certificate of Satisfactory Completion’ of training following which the University shall award the B.Sc (BOPTO) Degree and declare the candidate eligible for the same.
- (2) Satisfactory completion shall be determined on the basis of the following:
 - (a) Proficiency of knowledge required for each Investigation Techniques
 - (b) The competency in skills expected to manage each investigation Technique.
 - Competency for performance of self –performance
 - Of having assisted in procedures
 - Of having observed.
 - (c) Responsibility, Punctuality, workup investigation Techniques, involvement in procedures, follows of report.
 - (d) Capacity to work in a team (behavior with colleagues, nursing staff and relationship with Medical and Para medicals.
 - (e) Initiating, participation in discussions, research aptitude.

MEDIUM OF INSTRUCTION

English shall be the Medium of Instructions for all the subject of study and for examinations of Bachelor of Optometry course.

WORKING DAYS IN AN ACADEMIC YEAR

Each Academic year shall spread over a period of not less than 180 working days.

CONDITION OF LACK OF ATTENDANCE

As per the existing rules and regulations of SGRR University, Dehradun

SUBMISSION OF RECORD NOTE BOOKS

At the time of practical examination, each candidate shall submit to the examination the record notebooks duly certified by the Head of the College as abona fide record of work done by the candidate.

CLASSIFICATION OF SUCCESSFUL CANDIDATE

REVALUATION OF ANSWER PAPAERS

The regulations as prescribed by the University for other Undergraduate Course shall be applicable.

WARD OF MEDALS AND PRIZES

The University shall award at its convocation medals and prizes to outstanding candidates, as and when instituted by the donors as per the schedule as per the prescribed for the award.

UNIVERSITY RANKING

First, Second and third University ranks may be awarded to candidates, who have passed all the examination in the first appearance and taking into consideration the aggregate marks obtained in all the subjects in which the candidate had been examined during the entire course of study.

DISTRIBUTION OF PAPERS & MARKS IN VARIOUS YEARS

IST YEAR

Course Code	Course title	Marks for Theory			Marks for Practical			Total Marks
		IA*	EE*	Total	IA*	EE*	Total	
BSO101	Human Anatomy&Phsiology	30	70	100	30	70	100	200
BSO102	Ocular anatomy,pathology& microbiology	30	70	100	30	70	100	200
BSO 103	Ocular physiology &Biochemistry including binocular reflexes & its maintenance.	30	70	100	30	70	100	200
BSO 104	Optics	30	70	100	30	70	100	200
TOTAL		120	280	400	120	280	400	800

IIND YEAR

Course Code	Course title	Marks for Theory			Marks for Practical			Total Marks
		IA*	EE*	Total	IA*	EE*	Total	
BSO 201	Pharmacology & Pharmacy	30	70	100	30	70	100	200
BSO 202	Refraction(including prescription making &fitting of glasses)	30	70	100	30	70	100	200
BSO 203	Investigative ophthalmology	30	70	100	30	70	100	200
BSO 204	Ophthalmic instrument & appliances	30	70	100	30	70	100	200
TOTAL		120	280	400	120	280	400	800

IIIRDYEAR

Course code	Course title	Marks for Theory			Marks for Practical			Total Marks
		IA*	EE*	Total	IA*	EE*	Total	
BSO-301	Clinical advance optics & orthoptics	30	70	100	30	70	100	100
BSO-302	Clinical refraction & contact lens	30	70	100	30	70	100	200
BSO-303	Community ophthalmology & eye bank	30	70	100	30	70	100	200
BSO-304	Investigation in clinical ophthalmology	30	70	100	30	70	100	200
	TOTAL	120	280	400	120	280	400	800

Note:

1. The minimum pass marks will be 40% in individual subjects in theory and Practical and 50% in aggregate.
2. The Theory and Practical papers will be of equal weightage with 30% in Sessional and 70% in final University Examination.
3. The division will be determined on the basis of the aggregate of the marks of all the courses./subjects prescribed for the degree as under:
 - a) Passed with honors will be rewarded on 75% and above only in first attempt.
 - b) First Division will be marked on 60% and above.
 - c) Second Division will be marked on 50% and above but less than 60%.

Bachelor's in Optometry Ist year

Course code	: BSO-101
Course Name	: Human Anatomy & Physiology
Semester /Year	: I st Year

	L	T	P	C
	2		2	3

Theory	Practical
<ol style="list-style-type: none"> 1. Introduction of human body, cell and various tissue of the body 2. Embryology and development. 3. Skeletal system of Human body 4. Circulatory System 5. Digestive system 6. Respiratory system 7. Endocrine Organs 8. Excretory, 9. Reproductive system 10. Central Nervous System 11. Autonomic nervous system 12. Vitamins & Protein 	<ol style="list-style-type: none"> 1. Introduction of human body, cell and various tissue of the body 2. Embryology and development. 3. Skeletal system of Human body 4. Circulatory System 5. Digestive system 6. Respiratory system 7. Endocrine Organs 8. Excretory, 9. Reproductive system 10. Central Nervous System 11. Autonomic nervous system 12. Vitamins & Protein

Text Book

1. B. D Chourasia's Human Anatomy Fifth edition
2. Vikram Singh's Textbook of anatomy

Reference book-

1. Atlas of anatomy
2. Osteology

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	To understand the concept & terminology of Human anatomy & Physiology
CO2	To explain the structure, function & location of cells, tissues and major human organs system/part

CO3	To classify the function of various organ systems and employing its knowledge to identify diseases related to them.
CO4	. To explain interrelation between different organ system.
CO5	. To differentiate various organs and organ system.
CO6	To justify the various joints, muscle and nerves

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	2	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	--	-	1		-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry Ist year

Course code	: BSO-102
Course Name	: Ocular anatomy, Pathology & Microbiology
Semester /Year	: I st Year

	L	T	P	C
	1		1	2

Ocular Anatomy

Theory	Practical
1.Embryology in general 2. Orbit and its immediate relations 3. Lids and eyelids gland 4 Conjunctiva cornea and sclera 5 Iris and cilliary body	1.Embryology in general 2. Orbit and its immediate relations 3. Lids and eyelids gland 4 Conjunctiva cornea and sclera 5 Iris and cilliary body

6.Lens and vitreous 7.Retina and Choroid 8.Ocular muscles 9.Visual pathway 10.Symathetic and Parasympathathetics system 11.Vascular supply of eye 12.Lacrimal apparatus 13.Higher visual centres	6.Lens and vitreous 7.Retina and Choroid 8.Ocular muscles 9.Visual pathway 10.Symathetic and Parasympathathetics system 11.Vascular supply of eye 12.Lacrimal apparatus 13.Higher visual centre
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Ocular pathology and microbiology

Theory	Practical
1. Introduction to Microbiology & classification. 2. Gram Positive Bacteria 3. Gram Negative Bacteria 4. Fungi -sephorophytics and pathogenic 5. Viruses 6. Aseptic techniques 7. Chlamyadia & parasites. 8. Blood cells and Blood collection techniques 9. Haemoglobin estimation 10. Total leccocyte count 11. Differential leucocyte count 12. Pheripheral blood – staining, significance of a peripheral smear 13. Bleeding time, clothing time 14. Urine collection method 15. Physical examination of urine	1. Introduction to Microbiology & classification. 2. Gram Positive Bacteria 3. Gram Negative Bacteria 4. Fungi -sephorophytics and pathogenic 5. Viruses 6. Aseptic techniques 7. Chlamyadia & parasites. 8. Blood cells and Blood collection techniques 9. Haemoglobin estimation 10. Total leccocyte count 11. Differential leucocyte count 12. Pheripheral blood – staining, significance of a peripheral smear 13. Bleeding time, clothing time 14. Urine collection method 15. Physical examination of urine

16. Chemical examination of Urine	16. Chemical examination of Urine
17. Microscope Examination of urine	17. Microscope Examination of urine
18. Grossing of tissue	18. Grossing of tissue
19. Tissue processing	19. Tissue processing
20. select cutting	20. select cutting
21. Staining Hematoxylin & Cosin and special stains	21. Staining Hematoxylin & Cosin and special stains

Text book-

1-Fundamentals of Microbiology Jeffrey C. Pommerville

Refrance book-

1-Fundamentals of Microbiology Jeffrey C. Pommerville

2-Parson. Ramanjit Sihota

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	To understand relationship between different ocular structure.
CO2	To compare the concepts and terminology of ocular anatomy
CO3	To demonstrate the structure, functions and locations of different parts of eye.
CO4	. To recognize the different ocular structure.
CO5	To gain essential knowledge about the characteristics of bacteria ,virus and fungi
CO6	To analyze the clinical features of blood cells.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	2	-	-	-	-
CO4	-	-	-	-	1	-	-	-	-	-	-	-
CO5	-	-	1	-	-	-	-	2	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry Ist year

Course code	: BSO-103
Course Name	: Ocular physiology & biochemistry
Semester /Year	: I st Year

	L	T	P	C
	1	1		2

Theory	Practical
<ol style="list-style-type: none"> 1. General physiology of the eye - An introduction 2. Maintenance of Transparency of the Cornea 3. Maintenance of Transparency of the Lens 4. Visual acuity and form sense 5. Pupillary reflexes 6. Accommodation 7. Convergence 8. Intra Ocular Pressure 9. Night Vision 10. Colour Vision 11. Visual Fields 12. Higher Visual Centres 13. Electrophysiological Aspects 14. Conjugate and Disguate -Movements of the eye 15. Introduction to various biochemical test 16. Tears film and pH 17. Rhodopsin cycle 18. Aqueous and Vitreous humours 19. Metabolism of lens and cornea. 	<ol style="list-style-type: none"> 1. General physiology of the eye - An introduction 2. Maintenance of Transparency of the Cornea 3. Maintenance of Transparency of the Lens 4. Visual acuity and form sense 5. Pupillary reflexes 6. Accommodation 7. Convergence 8. Intra Ocular Pressure 9. Night Vision 10. Colour Vision 11. Visual Fields 12. Higher Visual Centres 13. Electrophysiological Aspects 14. Conjugate and Disguate -Movements of the eye 15. Introduction to various biochemical test 16. Tears film and pH 17. Rhodopsin cycle 18. Aqueous and Vitreous humours 19. Metabolism of lens and cornea.

Text book-

1-Adler's Physiology of eye 11 edition-Leonard A levin

Refrance Book-

Ophthalmology A K khurana

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	To understand the concept and terminology of ocular physiology.
CO2	To explain the normal functioning of all structures of the eye and their interactions.
CO3	To organize functions of various ocular structure and applying this knowledge to identify disease related to them.
CO4	To explain the inter relationships between different ocular structure.
CO5	To classify the phenomenon of vision.
CO6	To inspect physiology of extra ocular muscles.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	-	1	1	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	-	-	-	-	-	-	-	-
CO4	1	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	2	-	-	-	-	2	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry Ist year

Course code	: BSO-104
Course Name	: Optics

	L	T	P	C
	1		1	2

Theory	Practical
<ol style="list-style-type: none"> 1. Elementary basis of light- Interference, diffraction, 2. Principles of Refraction.and reflection 3. Physical Optics -1, Lens Shapes -Convex, Concave 4. Physical Optics -2, Thin Lens equation, thick lens equation 5. Physical Optics -3, Front and back vertex power 6. Physical Optics -4. Aberrations 7. Physical Optics -5. Spherical, Cylindrical & Toric surfaces, Aspheric surfaces 8. Prisms -definition, uses, nomenclature, apex 9. Determination of focal length & dioptric power of lens 10. Strum’s Conoid 11. Neutralization of lenses., Prismatic effect & Decentration 12. Schematic eye 13. Emmetropia & Ammetropia -Aetiology, Population, Distribution,Growth of eye, 14.Accommodation & Convergence -1, Far point, near point, range, amplitude of accommodation 15. Accommodation & Convergence -2. Methods of measurements, NPA. 	<ol style="list-style-type: none"> 1. Trial Box 2. Vision Charts 3 –Use of Convex & Concave lenses 4. Neutralization of lenses., Prismatic effect & Decentration 5.Accommodation & Convergence -1, Far point, near point, range, amplitude of accommodation 6. Accommodation & Convergence -2. Methods of measurements, NPA.

Text books-

- 1. Borish’s Clinical Refraction**
- 2.Duke elder Practice of refraction**

Refrance books –

- 1. Theories and practice of Optics and refraction- A K khurana**
- 2. Optics & Refraction L.P Aggarwal**

Course outcomes (COs):

Upon successful completion of the course a student will be able to-

CO1	To define the concepts and theories of light, its nature & properties
CO2	To choose the concepts and theories of interference, polarization & Diffraction
CO3	To build the concept of schematic and Reduce eye and Visual acuity
CO4	To explain the concept of Image formation by different types of lenses
CO5	To distinguish the concept of refractive error and its management options
CO6	To classify the concept of Accommodation & Presbyopia

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	1	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	1	-	-	-	-	-	-	-	-	-
CO5	3	-	-	--	-	1	-	-	-	-	-	-
CO6	2	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 2nd year

Course code	: BSO-201
Course Name	: Pharmacology & Pharmacy
Semester /Year	: 2 nd Year

	L	T	P	C
	1	1	2	3

Theory	Practical
1. Ocular Pharmacology – An introduction 2. Autonomic nervous system 3. Routes of drug administration 4. Miotics, Mydriatics & Cycloplegics drugs 5. Antibacterial drugs & therapy 6. Antifungal drugs & therapy 7. Anti-Viral drugs & therapy 8. Anti-inflammatory drugs & therapy 9. Anti-glaucoma drugs & therapy 10. Ophthalmic dyes 11. Local Anaesthetics 12. Ophthalmic preservatives 13. Ocular lubricants 14. Ocular irrigating solutions 15. Ocular antiseptics & disinfectants 16. Anti-cataract agents 17. contact lens solution	1. Quality Control : 2 Sterilization 3. Ph measurement 4. Osmolarity 5. Spectrophotometry for concentration 6. How to prepare following eye drops: a. Vancomycin eye drops b. Ceftazidime eye drops c. Fortified tobramycin eye drops d. Fortified Cefazoline eye drops e. EDTA eye drops f. Ascorbate eye drops g. Mitomycin eye drops h. Voriconazole eye drops i. Sodium citrate eye drops 7. MK Media preparation 8. Fluorescein Strip, Rose Bengal Strips 9. Autologous serum eye drops preparation 10. Dilution of drug in different concentration

Text book-

1. Dr. R L Sharma Ophthalmic pharmacology and therapies
2. Dr. S k Gupta Clinical Ocular Pharmacology & Therapeutics

Reference book-

1. Comprehensive Ophthalmology A K khurana

2. Parson. Ramanjit Sihota

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To understand the concept & terminologies of Pharmacology and ocular preparations.
CO2	To illustrate the routes of drug administration in ophthalmology
CO3	To apply of different pharmaceutical agents in the management of Ocular diseases.
CO4	To analyze and applying diagnostic and therapeutic drugs in ophthalmology.
CO5	To conduct the procedure for installing cycloplegics and mydratics to see the effect of drugs.
CO6	To prepare various ways of disinfection

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	1	-	-	-	-	2	-	-	-	-
CO2	2	-	-	1	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	2	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	-	-	-	-
CO5	1	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 2nd year

Course code	: BSO-202
Course Name	: Refraction (Including prescription making and fitting of glasses)
Semester /Year	: 2 nd Year

	L	T	P	C
	1		2	1.5

Theory	Practical
1. Emmetropia & Ammetropia – 2. classification of refractive errors 3. Myopia 4. Hypermetropia 5. Astigmatism 6. Aphakia/Pseudo-phakia 7. Presbyopia 8. Accommodation & Convergence – Far point, near point, ranges. Amplitude of accommodation 8. Accommodation & Convergence – Methods of measurements, NPA,NPC, AC/A ratio. 9. Retinoscopy –Principle & Method 10. Objective and subjective refraction	1. Objective and subjective refraction 2. Prescription of glases in OPD 4.. classification of refractive errors 5. Aphakia/Pseudo-phakia 6. Presbyopia 8. Accommodation & Convergence – Far point, near point, ranges. Amplitude of accommodation 7 Accommodation & Convergence – Methods of measurements, NPA,NPC, AC/A ratio. 8. Retinoscopy –Principle & Method

Text books-

2. Borish's Clinical Refraction
2. Duke elder Practice of refraction

Refrance books –

3. Theories and practice of Optics and refraction- A K khurana
4. Optics & Refraction L.P Aggarwal

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To name the various optical content of eye & their measurements..
CO2	To rephrase about various refractive anomalies of the eye.
CO3	To apply all the theoretical skills on practical purpose.
CO4	To examine the concept of different types and design of ophthalmic lenses.
CO5	To categorize the various aspects of vision and measuring visual acuity
CO6	To detect knowledge about various optical defects of eye.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	2	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	3			-	-	-	-	-	-	-	-
CO5	3	-	2	-	-	-	-	-	-	-	-	-
CO6	-	2	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 2nd year

Course code	: BSO-203
Course Name	: Investigative Ophthalmology
Semester /Year	: 2 nd Year

	L	T	P	C
	1	1	2	3

Theory	Practical
1. Orthoptics-General Concept 2. Ocular muscles and movements Orthoptics 3. Orthoptics- Exercises 4. Squint workup 5. Measurements of angle of squint 6. Latent squint 7. Manifest squint 8. Maddox rod	1. Orthoptics-General Concept 2. Ocular muscles and movements Orthoptics 3. Orthoptics- Exercises 4. Squint workup 5. Measurements of angle of squint 6. Latent squint 7. Manifest squint 8. Maddox rod

9 Maddox wing 10. Synoptophore 11.Head posture and its significance 12. Hess Screening and its Interpretations 13. Pleoptics 14 Occlusion –types and uses 15. Testing of ARC 16. Amblyopia 17. Disorders of accommodation	9 Maddox wing 10. Synoptophore 11.Head posture and its significance 12. Hess Screening and its Interpretations 13. Pleoptics 14 Occlusion –types and uses 15. Testing of ARC 16. Amblyopia 17. Disorders of accommodation
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Text book-

1. Theory and Practice of Squint and orthoptics-A K Khurana
2. Strabismus simplified-Pradeep sharma

Reference book-

- 1 Theory and Practice of Squint and orthoptics -A K Khurana
- 2 **Parson.** Ramanjit Sihota

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To choose the general concept of orthoptics.
CO2	To understand the anatomy of extra ocular muscles and their movement.
CO3	To assess the pediatric visual acuity and refraction.
CO4	To explain the causes and treatment of amblyopia.
CO5	To decide the use of synaptophore and its advantages.
CO6	To analyze the binocular single vision and their grades.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	2	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-

CO4	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	2	--	-	-	-	-	-	-	-	-	-
CO6	3	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 2nd year

Course code	: BSO-204
Course Name	: Ophthalmic Instrument & appliances
Semester /Year	: 2 nd Year

	L	T	P	C
	1		2	1.5

Theory	Practical
1. Indirect Ophthalmoscope	1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope	2. Direct Ophthalmoscope
3. Slit Lamp: Haag-Streit.	3. Slit Lamp: Haag-Streit.
4. Lensometer. Lens gauge	4. Lensometer. Lens gauge
5. Tonometer	5. Tonometer
6. Fundus Camera	6. Fundus Camera
7. Auto-refractometer	7. Auto-refractometer
8. Placido disc	8. Placido disc
9. Katerometer	9. Katerometer
10. Biometry	10. Biometry
11. Perimeter – Manual & automated	11. Perimeter – Manual & automated
12. Contrast sensitivity tests	12. Contrast sensitivity tests
13. Glare acuity tests	13. Glare acuity tests
14. Colour vision tests	14. Colour vision tests
15. Syringing	15. Syringing
16. Gonioscopy	16. Gonioscopy

Text book-

1. Ophthalmology book. A K khurana

2. Text book of ophthalmology for paramedical courses Sanjeev Agarwal

Reference book-

1. A K khurana Ophthalmology

2. Parson. Ramanjit Sihota

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To define the method of using indirect ophthalmoscope and their advantage.
CO2	To compare the difference between contact and non contact tonometer.
CO3	To explain the advantage of automated perimetry over manual.
CO4	To discover the use of orthoptics instrument.
CO5	To examine and describe colour vision test.
CO6	To determine the knowledge of slit lamp examination.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	3	-	-	2	-	-	-	-	-
CO2	-	-	-	-	-	-	2	-	-	-	-	-
CO3	-	2	-	-	-	-	-	-	-	-	-	-
CO4	-	-	3	-	-	-	-	-	-	-	-	-
CO5	1	-	-	-	-	-	-	3	-	-	-	-
CO6	2	-	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry^{3rd} year

Course code	: BSO-301
Course Name	: Clinical advance optics & orthoptics
Semester /Year	: 3 rd Year

	L	T	P	C
	1		1	1.5

Theory	Practical
1. Classification of squint and 2. Management of squint 3. Pleoptics 4. Occlusion – Therapy 5. Nystagmus 6. Amblyopia 7. Disorders of accommodation 8. Neural aspects of binocular vision 10.. Testing of ARC 11. Orthoptics- Exercises	1. squint workup Classification of squint and squint workup 2. Management of squint 3. Pleoptics 4. Occlusion – Therapy 5. Nystagmus 6. Amblyopia 7. Disorders of accommodation 8. Neural aspects of binocular vision 10.. Testing of ARC 11. Orthoptics- Exercises

Text book-

- 1. Theory and Practice of Squint and orthoptics A K Khurana**
- 2. Strabismus simplified Pradeep sharma**

Refrence book-

- 1Theory and Practice of Squint and orthoptics A K Khurana**

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	To select the measurement of angle of squint.
CO2	To interpret the disorders of accommodation.
CO3	To assess the convergence anomalies and their clinical significance.
CO4	To distinguish the causes, treatment and management of amblyopia.
CO5	To examine the difference between paralytic and non paralytic squint.
CO6	To discuss the classification of strabismus.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	-	2	-	-	-	1	-	-	-	-
CO2	-	-	-	3	-	-	2	-	-	-	-	-
CO3	-	-	-	3	-	-	2	-	-	-	-	-
CO4	2	3	-	-	-	-	-	-	-	-	-	-
CO5	-	3	-	-	-	-	-	2	-	-	-	-
CO6	-	3	-	-	-	-	-	2	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 3rd year

Course code	: BSO-302
Course Name	: Clinical Refraction & contact lens
Semester /Year	: 3 rd Year

	L	T	P	C
	1	1	2	3

Theory	Practical
<p>Refraction and contact lenses</p> <ol style="list-style-type: none"> 1. Keratoconus 2. Post-Op. Refractive errors 3. Refraction of irregular re/ex 4. Retinoscopy -Principle & Methods 5. Objective Refraction 6. Subjective Refraction 7. Cross Cylinder 8. Use of Prisms 9. Low Vision Aids 10. Paediatric visual acuity assessment 11. Paediatric Refraction <p>Contact Lenses</p> <ol style="list-style-type: none"> 1. History of Contact Lenses 2. Corneal Physiology and Contact Lens 3. Preliminary Measurements and Investigations 4. Slit Lamp Biomicroscopy 5. Contact Lens materials 	<p>Refraction and contact lenses</p> <ol style="list-style-type: none"> 1. Keratoconus 2. Post-Op. Refractive errors 3. Refraction of irregular re/ex 4. Retinoscopy -Principle & Methods 5. Objective Refraction 6. Subjective Refraction 7. Cross Cylinder 8. Use of Prisms 9. Low Vision Aids 10. Paediatric visual acuity assessment 11. Paediatric Refraction <p>Contact lens</p> <ol style="list-style-type: none"> 1. Preliminary Measurements and Investigations 2. Slit Lamp Biomicroscopy 3. Rigid gas permeable contact lens fitting 4. Soft Contact lens fitting 5. Follow-up Slit Lamp examination

6. Optics of the Contact Lens 7. Rigid gas permeable contact lens design 8. Soft Contact lens design & manufacture 9. Follow-up Slit Lamp examination 10. Fitting in Keratoconus 11. Fitting in Aphakia, Pseudophakia 12. Cosmetic Contact Lenses 13. Fitting Contact Lens in children 14. Toric Contact Lenses 15. Bifocal Contact Lenses 16. Continuous wear and extended wear lenses 17. Therapeutic Lenses/Bandage lenses 18. Use of Specular Microscopy and Pachymetry in Contact Lenses 19. Care & maintenance of Contact Lenses 20. Complications of contact Lenses	6. Fitting in Keratoconus 7. Fitting in Aphakia, Pseudophakia 8. Cosmetic Contact Lenses 9. Fitting Contact Lens in children 10. Use of Specular Microscopy and Pachymetry in Contact Lenses 11. Care & maintenance of Contact Lenses 12. Complications of contact Lenses
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Text book-

1. Theories and practice of Optics and refraction

2. Contact lens Primer Monika Chaudhary

Refrance book-

1. Theories and practice of Optics and refraction-A K khurana

Course outcomes (COs):

Upon successful completion of the course a student will be able to

CO1	To understand about soft contact lenses material and their properties
CO2	To explain complication and their management of contact lenses
CO3	To organize the management of refractive error.
CO4	To divide the indications and contraindications of contact lenses
CO5	To analyze the post operative refractive error.
CO6	To conclude the concept of convergence.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	-		-	-	-	-	-	-	-	-
CO2	-	-	-	3		-	-	-	-	-		-

CO3	-	3	-	-	-	-	1	-	-	-	-	-
CO4	-	1	-	-	-	-	-	-	-	-	-	-
CO5	-	1	-	-	2	--	1	-	-	-	-	-
CO6	-	2	-	-	-	-	-	-	-	-	-	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 3rd year

Course code	: BSO-303
Course Name	: Community Ophthalmology & Eye bank
Semester /Year	: 3 rd Year

	L	T	P	C
	1		1	1.5

Theory	Practical
<p>Eye bank</p> <ol style="list-style-type: none"> 1.Publicity 2.How to donate youe eyes 3.Preservation of eyes 4.Pre operative instruction 5.Post operative instruction 6.Latest techniques for preservation of donor cornea <p>Community Ophthalmology</p> <ol style="list-style-type: none"> 1.Concept of community Ophthalmology-1 2.Concept of community ophthalmology-2 3.The epidemiology of blindness (general principal)-1 4.The epidemiology of blindness (general principal)-2 	<p>Eye bank</p> <ol style="list-style-type: none"> 1.Publicity 2.How to donate youe eyes 3.Preservation of eyes 4.Pre operative instruction 5.Post operative instruction 6.Latest techniques for preservation of donor cornea <p>Community Ophthalmology</p> <ol style="list-style-type: none"> 1.Concept of community Ophthalmology-1 2.Concept of community ophthalmology-2 3.The epidemiology of blindness (general principal)-1 4.The epidemiology of blindness (general principal)-2

5.The epidemiology of blindness (general principal)-3	5.The epidemiology of blindness (general principal)-3
6.The epidemiology of blindness (general principal)-4	6.The epidemiology of blindness (general principal)-4
7.Survey methodological-1	7.Survey methodological-1
8.Survey methodological-2	8.Survey methodological-2
9.Survey methodological-3	9.Survey methodological-3
10.Screening procedures in ophthalmology-1	10.Screening procedures in ophthalmology-1
11.Screening procedures in ophthalmology-2	11.Screening procedures in ophthalmology-2
12.School eye screening programme	12.School eye screening programme
13.Primary eye care	13.Primary eye care
14.Organization of out reach services	14.Organization of outreach services
15.Rehabilitation of the visually handicapped	15.Rehabilitation of the visually handicapped
16.National programme for control of blindness-1	16.National programme for control of blindness-1
17.National programme for control of blindness-2	17.National programme for control of blindness-2
18.Vision 2020: The right to Sight	18.Vision 2020: The right to Sight

Text Book-

- 1.Comprehensive .Ophthalmology text book A K khurana
- 2.Parsons' Diseases of eye fifth edition- Ramanjit Sihota

Refrance Book-

- 1.Comprehensive Ophthalmology text book- A K khurana
2. Parson Ramanjit Sihota

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To understand the role of optometrist in public health
CO2	To classify the basic definition and classification of LOW vision.
CO3	To develop the basic concept of eye banking.
CO4	To explain the National programme for control of blindness.
CO5	To examine the difference between subjective and objective refraction.
CO6	To conclude the procedure and storage of eye in EYE BANK. Safety aspects in eye department, OT instruments and sterility.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	-	-	-	-	-	-	-	3	3	2
CO2	1	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	3	-	-	-	-	-	-	2	-
CO4	-	-	-	-	-	-	-	-	-	-	3	-
CO5	2	2		-	-	--	-	-	-	-		-
CO6		-	-	-	-	-	-	-	1	-	3	-

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Bachelor's in Optometry 3rd year

Course code	: BSO-304
Course Name	: Investigation in clinical ophthalmology & Management of ot
Semester /Year	: 3 rd Year

	L	T	P	C
	1	1	2	3

Theory	Practical
1. Indirect Ophthalmoscope	1. Indirect Ophthalmoscope

2. Direct Ophthalmoscope 3. Slit Lamp: Haag-Streit. 4. Lensometer. Lens gauge 5. Non-contact Tonometer 6. Fundus Camera 7. Auto-refractometer 8. Placido disc 9. Katerometer 10A-scan .Biometry 11. Perimetry – Manual & automated 12. Contrast sensitivity tests 13. Glare acuity tests 14. Colour vision tests 15.Syringing & lacrimal function test 16.Gonioscopy 17. VKG,ERG,EOG 18. OCT 19.UBM 20. Flurescein angiography 21. Introduction to ocular in general 22. Asepsis: How to achieve	2. Direct Ophthalmoscope 3. Slit Lamp: Haag-Streit. 4. Lensometer. Lens gauge 5. Non-contact Tonometer 6. Fundus Camera 7. Auto-refractometer 8. Placido disc 9. Katerometer 10A-scan .Biometry 11. Perimetry – Manual & automated 12. Contrast sensitivity tests 13. Glare acuity tests 14. Colour vision tests 15.Syringing & lacrimal function test 16.Gonioscopy 17. VKG,ERG,EOG 18. OCT 19.UBM 20. Flurescein angiography 21. Introduction to ocular in general 22. Asepsis: How to achieve
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Text Book-

- 1.Comprehensive Ophthalmology text book-A K khurana
- 2.Parsons’ Diseases of eye fifth edition-Ramanjit Sihota

Refrance Book-

1. ComprehensiveOphthalmology text book -A K khurana

Course outcomes (Cos):

Upon successful completion of the course a student will be able to

CO1	To recall the syringing and lacrimal functions test.
CO2	To understand the role of specular microscopy.

CO3	To describe the Optical coherence tomography
CO4	To examine the fundus photography .
CO5	To explain the ophthalmic drugs and dyes used in OT.
CO6	To analyze the angle of anterior chamber through gonioscopic lenses.

CO-PO Mapping

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	1	1	-	2	-	-	-	-	-
CO2	2	1	-	-	-	-	-	2	-	-	-	-
CO3	-	-	-	-	-	-	-	2	1	-	-	1
CO4	-	-	-	-	-	-	-	2	1	-	-	1
CO5	1	-	-	-	-	-	-	2	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	1

3: Highest Correlated, 2: Medium Correlated, 1: Lowest Correlated

Objectives Of The Course Main Purpose :

- 1.To achieve general understanding of the Human Biology (Anatomy, Physiology, and Biochemistry).
2. To achieve good understanding of the basic medical sciences as related to ophthalmology.
3. To be able to follow WHO criteria of a Multi Purpose Worker.

Basic Medical Sciences

1. To achieve general understanding of the Human Biology (Anatomy, Physiology, and Biochemistry).
2. To achieve good understanding of the basic medical sciences as related to Ophthalmology (Anatomy, Physiology, Optics, Pharmacology and Microbiology).

Clinical

The objective of the clinical work are to enable a student to work under the supervision of an Ophthalmologist so as to render assistance, develop skills and to perform other optometric jobs.

1. Be able to develop skills to carryout Ophthalmic Investigations.
2. Be able to do refraction work including prescription of glasses, contact lenses, low vision aids.
3. Be able to assess disorder of Ocular motility and uniocular and binocular visual functions and knowledge of principles of non-surgical therapy and indications of surgery.

4. To impart knowledge with regard to common eye diseases with a view to acquaint them in their recognition.
5. To impart training to develop skill in manufacturing of spectacle lenses and contact lenses.
6. To impart knowledge regarding organizations of eye banks and preservation of ocular tissues.
7. To impart knowledge regarding importance and the methodology of conducting surveys for early detection of visual defects, prevalence of ocular diseases and organization of community services like eye camps, schools, clinics and community eye care programme.
8. To impart knowledge regarding the programme of blindness, its causes and principles of rehabilitation of the blind.
9. To get a wide range of exposure and be able to assist in various procedures in Ophthalmology.
10. To learn and develop expertise in the functioning of operation theatre.

Expectations from a trained optometrist

1. Be able to develop skills to carryout Ophthalmic Investigations.
2. Be able to do refraction work including prescription of glasses, contact lenses, low vision aids.
3. Be able to assess disorder of Ocular motility and uniocular and binocular visual functions and knowledge of principles of non-surgical therapy and indications of surgery.
4. To impart knowledge with regard to common eye diseases with a view to acquaint them in their recognition.
5. To impart training to develop skill in manufacturing of spectacle lenses and contact lenses.
6. To impart knowledge regarding organizations of eye banks and preservation of ocular tissues.
7. To impart knowledge regarding importance and importance and the methodology of conducting surveys for early detection of visual defects, prevalence of ocular diseases and organization of community services like eye camps, schools, clinics and community eye care programme.

8. To impart knowledge regarding the programme of blindness, its causes and principles of rehabilitation of the blind.
9. To get a wide range of exposure and be able to assist in various procedures in Ophthalmology.
10. To learn and develop expertise in the functioning of operation theatre.

SEMINARS

All students have to attend Seminars

To be Presented by First Year

1. Frames & Spectacle Lens Materials
2. Visual acuity methods
3. Principles and application of Retinoscopy
4. Comparison between Static and Dynamic Retinoscopy
5. Subjective Methods of Refraction
6. Objective Methods of Refraction¹.
7. Embryology of eye
8. Anatomy and physiology of retina & optic nerve
9. Physiology for corneal
10. Physiology for lens
11. Extraocular muscles
12. Sturm Conoid To be

Presented by Second Year .

1. Principles of direct & indirect Ophthalmoscopy
2. Principles of FA
3. Principles & comparison of various types of tonometry
4. Theoretical Comparison between Static & Kinetic Perimetry
5. Classification of refractive errors
6. Mydriatics and cycloplegics
7. Local anesthetics 8. Orthoptics basics

To be presented by Third Year

1. Diagnosis of latent and manifest squint
- 2 Amblyopic and pleoptics treatment
3. Normal & pathological fundus
4. Fundus Camera & application of FA.
5. Lasers and its uses in Ophthalmology
6. Basic of refractive Surgery
7. Low vision aids for poor vision patients
8. Materials and manufacturing techniques of contact lenses
9. Indications & Contra-indications for Contact Lenses
10. Fitting philosophies of contact lenses
11. Post fitting problems of contact lenses and its remedy
12. Toric/Bifocal Contact lenses
13. Visual fields defects in Glaucoma
14. Visual fields defects in retinal & neurological disorders
15. Latest developments in perimetry

Postings of optometry students

1st year	Physiology	Microbiology	Pathology
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2nd year	Eye OPD	Eye ward	Pharmacy
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3rd year	Refraction	Orthoptics	Ophthalmic Appliances	Camps and community surveys	Eye banking and eye OT
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Internship	Refraction	Orthoptics	Ophthalmic appliances	Camps	Eye Banking	Eye OT	Community surveys	Speciality Clinic
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