Era University

CURRICULUM & EVALUATION SCHEME

OF

BACHELOR OF OPTOMETRY (B.OPTOM)

[APPLICABLE W.E.F. ACADEMIC SESSION 2023-27**]**

ERA UNIVERSITY
Hardoi Road, Lucknow, Uttar Pradesh Website:
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About Optometry:

The Ministry of Health and Family Welfare, accepted in its entirety the definition of an allied and healthcare professional based on the afore-mentioned report, though the same has evolved after multiple consultations and the recommended definition is now as follows-

> 'Allied and healthcare professionals (AHPs) includes individuals involved with the delivery of health or healthcare related services, with qualification and competence in therapeutic, diagnostic, curative, preventive and/or rehabilitative interventions. They work in multidisciplinary health teams in varied healthcare settings including doctors (physicians and specialist), nurses and public health officials to promote, protect, treat and/or manage a person('s) physical, mental, social, emotional, environmental health and holistic well-being.'

Since the past few years, many professional groups have been interacting and seeking guidance on all those who would qualify under the purview of "allied and healthcare professionals". In the healthcare system, statutory bodies exist for clinicians, nurses, pharmacists and dental practitioners; but a regulatory structure for around 50 professions is absent in India. Currently, the Government is considering these professions (as listed Annex-1) under the ambit of the allied and healthcare system. However, this number is subject to changes and modifications over time, particularly considering how quickly new technologies and new clinical avenues are expanding globally, creating newer cadres of such professionals.

Scope and Need for Allied and Healthcare Professionals in the Indian Healthcare System

The quality of medical care has improved tremendously in the last few decades due to the advances in technology, thus creating fresh challenges in the field of healthcare. It is now widely recognized that health service delivery is a team effort involving both clinicians and non-clinicians, and is not the sole duty of physicians and nurses.1Professionals that can competently handle sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis is now so dependent on technology, that allied and healthcare professionals (AHPs) are vital to successful treatment delivery.

Effective delivery of healthcare services depends largely on the nature of education, training and appropriate orientation towards community health of all categories of health personnel, and their capacity to function as an integrated team. For instance in the UK, more than 84,000 AHPs, with a range of skills and expertise, play key roles within the National Health Service, working autonomously, in multi-professional teams in various settings. All of them are first-contact practitioners and work across a wide range of locations and sectors within acute, primary and community care. Australia's health system is managed not just by their doctors and nurses, but also by the 90,000 university-trained, autonomous AHPs vital to the system.

As the Indian government aims for Universal Health Coverage, the lack of skilled human resource may prove to be the biggest impediment in its path to achieve targeted goals. The benefits of having AHPs in the healthcare system are still unexplored in India. Although an enormous amount of evidence suggests that the benefits of AHPs range from improving access to healthcare services to significant reduction in the cost of care, though the Indian healthcare system still revolves around the doctor-centric approach. The privatization of healthcare has also led to an ever-increasing out-of-pocket expenditure by the population. However, many examples assert the need of skilled allied and healthcare professionals in the system, such as in the case of stroke survivors, it is the support of AHPs that significantly enhance their rehabilitation and long term treatment ensures return to normal life. AHPs also play a significant role to care for patients who struggle mentally and emotionally in the current challenging environment and require mental health support; and help them return to well-being. Children with communication difficulties, the elderly, cancer patients, patients with long term conditions such as diabetes people with vision problems and amputees; the list of people and potential patients who benefit from AHPs is indefinite.

Thus, the breadth and scope of the allied and healthcare practice varies from one end to another, including areas of work listed below:
Across the age span of human development from neonate to old age;

With patients having complex and challenging problems resulting from systemic illnesses such as, in the case of diabetes, cardiac abnormalities/conditions and elderly care to name a few;

Towards health promotion and disease prevention, as well as assessment, management and evaluation of interventions and protocols for treatment;

In a broad range of settings from a patient's home to community, primary care centers, to tertiary care settings; and

With an understanding of the healthcare issues associated with diverse socio-economies and cultural norms within the society.

Learning Goals And Objectives For Allied And Healthcare Professionals

The handbook has been designed with a focus on performance-based outcomes pertaining to different levels. The learning goals and objectives of the undergraduate and graduate education program will be based on the performance expectations. They will be articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various levels of qualification and professional cadres:

1. Clinical care
2. Communication
3. Membership of a multidisciplinary health team
4. Ethics and accountability at all levels (clinical, professional, personal and social)
5. Commitment to professional excellence
6. Leadership and mentorship
7. Social accountability and responsibility
8. Scientific attitude and scholarship (only at higher level- PhD)
9. Lifelong learning

ERA UNIVERSITY

Study of Evaluation Scheme
Of
Bachelor of Optometry (B.Optom)

Programme : **Bachelor of Optometry(**B.optom)

Duration : Four years Full time(Eight semesters)
Including one year compulsory Internship

Medium : English

Minimum Required Attendance : 75%

Total Credits **: 200**

Assessment :

Internal	External	Total
30	70	100

Internal Evaluation (Theory Papers):

Class Presentation	Care Marks	Attendance	Assignment	Mid Term Exam	Total
04	06	04	04	12	30

Evaluation of Practical/Dissertations & Project Reports:

Internal	External	Total
30	70	100

Duration of Examination:

Internal	External
01 Hrs	03 Hrs

To qualify a course/subject the student is required to secure a minimum of 40% marks in aggregate including the semester examination and teachers continuous evaluation. (i.e. both internal and external). A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have secured at least 50% marks in aggregate to clear the semester. The subject marked with asterisk (*) in Semester-I &II are noncore papers.

Eligibility for admission:

Selection procedure:

1. He/she has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with pass marks in Physics, Chemistry, Biology

OR

Diploma in Optometry after completing 12th class/ 10 +2 of CBSE or equivalent with minimum aggregate of 50% marks in physics chemistry and biology provided the candidate has passed in each subject separately.

2. Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities will form the guideline to determine the eligibility and must have passed in the subjects: Physics, Chemistry, Biology and English up to 12th Standard level.
3. Candidates who have passed the Senior Secondary school Examination of National Open School with a minimum of 5 subjects with any of the following group subjects.

A. English, Physics, Chemistry, Botany, Zoology

B. English, Physics, Chemistry, Biology and any other language

4. He/she has attained the age of 17 years as on - (current year) & maximum age limit is 30 years.
5. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.
6. Admission to B.Opto course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.

A. Entrance test, to be conducted by the university as per the syllabus under 10 +2 scheme of CBSE, subject-wise distribution of questions will be as 30% in Physics, 30% in biology, 30% in Chemistry, 5% in English (Language & Comprehension) and 5% in General Awareness about health related methods.

B. . Successful candidates on the basis of written Test will be called for the interview & shall have face an interview board. The interview board will include the Head of the Department of medical imaging (Chairman of the Board) along with the Principal / chief faculty as well

as Chief of MRIT apart from other nominees, whose recommendations shall be final for the selection of the students..

C. During subsequent counseling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.

D. Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.

E. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice.

Provision of Lateral Entry:

Lateral entry to second year for allied and healthcare science courses for candidates who have passed diploma program from the Government Boards and recognized by State/Central University, fulfilling the conditions specified and these students are eligible to take admission on lateral entry system only if the same subject have been studied at diploma level.

Duration of the course

Duration of the course: 4 years or 8 semesters including1440 hours of internship.

Medium of instruction:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

General information:

1. Attendance:

A candidate has to secure minimum 80% attendance in overall with at least-

A. 75% attendance in theoretical

B. 75% in Skills training (practical) for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

2. Assessment:

Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training programme. To achieve this, all assessment forms and feedback should be included and evaluated. Student must

attain at least 40% marks in each Theory, Internal assessment and Practical independently / separately for each individual subject.

>70% Distinction

60%-First Division

50-59% Second Division

40-49% Third Division

3. Aggregate passing marks 40%.
4. Practical exam must be completed within 15 days after the theory exam.
5. 15 Days summer vacation and 7 days winter vacation.
6. A candidate who is fails in all subject will be termed as year back and if candidate passes in 50% of subject then he will be promoted in next semester and if candidate passes his/her in all subject then it will be termed as all clear.
7. Abbreviation used:

   L- Lecture

   P-Practical

   T-Tutorial

   H-Hospital posting

INTERNSHIP

Internship is a phase of training where a student is expected to conduct actual practice of clinical optometry and acquire skills under supervision so that he/she may become capable of functioning independently.

INTERNSHIP DURATION: ONE YEAR

Every candidate will be required after successfully completing the final Bachelor in Optometry Examination, to undergo compulsory rotator internship to satisfaction of the University for a period of 6 months so as to be eligible for the award of the degree.

The University shall issue a provisional degree of Bachelor in Optometry on passing the final examination after the completion of internship on demand by the candidate.

The internee shall be entrusted with optometry responsibilities under direct supervision of Senior Optometrist. They shall not be working independently.

Internee will not issue certified copy of investigation reports or other related documents under their signature.

ASSESMENT OF INTERNSHIP

The Internee shall maintain the record of work, which is to be verified and certified by the senior Optometrist under whom he/she works. Apart from scrutiny of record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during at the end of training. Based on the record of work and date of evaluation The Director/Principal shall issue certificate for satisfactory completion of training following which the university shall award the degree of Bachelor in Optometry to the candidate.

- Satisfactory completion shall be determined on the basis of the following.
- Proficiency of knowledge required for each Optometry techniques.
- The competency and skills expected to manage each optometry technique.
- Responsibility, punctuality works up of optometry techniques, involvement in special procedures and preparation of reports.
- Capacity to work in a team (behavior with colleagues, nursing staff and relationship with medical and paramedical).
- Initiating, **participating** in discussions and developing research aptitude.

- Only 12 leaves are allowed to an internee during the period of his/her internship. If he/she extend his/her leave in the duration of internship, the period the internship shall be extended by double the days for which the student was absent.

Leave Rule

Summer Vacation: - 15 Days

Winter Vacation: - 7 Days

Preparation Leave: - 7 Days

Internship Log Book

The Log Book Submitted by the candidate will be duly verified & a viva voce shall be conducted on the same at the time of Practical Examination of final year.

S.N.	TOPIC	NO. OF CASES
1	Clinical Observation and Report writing	5
2	Visual Acuity – Distance + Near	5
3	History taking General Specific Conditions	5
4	Visual Acuity – Distance + Near (log MAR) Pinhole acuity	5
5	Extra ocular Motility	5
6	Cover test	5
7	Push up test (Amplitude of Accommodation)	5
8	Push up test (Near point of Convergence)	5
9	Stereopsis test	5
10	Tear Break up time	5
11	Amsler's Grid test	5
12	Color vision test	5
13	Schirmer's test	5
14	Confrontation visual field test	5
15	Slit lamp examination	5
16	Digital tonometry	5
17	Schiotz Tonometry	5
18	Von Herick Grading of Anterior chamber depth	5
19	Accommodative facility(+ 2.00 D)	5
20	Corneal Sensitivity test	5
21	IPD measurement	5
22	Proptosis evaluation	5
23	Ptosis evaluation	5
24	Pupillary evaluation Direct Consensual RAPD	5
25	Maddox rod (Phoria)	5

26	Retinoscopy- Static, Dynamic and Cycloplegic Retinoscopy	5
27	Keratometry	5
28	Subjective Refraction JCC Duo chrome	5
29	Visual Field chart interpretation	5
30	B scan observation	5
31	A scan chart Interpretation	5
32	Case Analysis	5
33	Contact Lens	5
34	Low Vision care Clinic	5
35	Binocular Vision clinic	5
36	Ophthalmology clinic (Common eye conditions)	10

Programme Structure 2023

Bachelor of Optometry (Total Credits -

B.Optom Semester- I (First Year)

First Semester

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	General Anatomy	BOT-101	03	03	30	70	100
2.	General Physiology	BOT-102	03	03	30	70	100
3.	General Biochemistry	BOT-103	02	02	30	70	100
4.	Geometrical Optics-I	BOT-104	03	03	30	70	100
5.	Nutrition	BOT-105	02	02	30	70	100
6.	English & Communication Skill	ENG-101	02	02	30	70	100
	Total		**15**	**15**	**180**	**420**	**600**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	General Anatomy	BOP-101	02	01	30	70	100
2.	General Physiology	BOP-102	02	01	30	70	100
3.	General Biochemistry	BOP-103	02	01	30	70	100
4.	Geometrical Optics-I	BOP-104	02	01	30	70	100
	Total		**08**	**04**	**120**	**280**	**400**

B.Optom Semester- II (First Year)

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Ocular Anatomy	BOT-201	03	03	30	70	100
2.	Ocular Physiology	BOT-202	03	03	30	70	100
3.	Ocular Biochemistry	BOT-203	02	02	30	70	100
4.	Geometrical Optics-II	BOT-204	03	03	30	70	100
5.	Physical Optics	BOT-205	02	02	30	70	100
6.	Basic of Computers	BOT-206	02	02	30	70	100
	Total		**15**	**15**	**180**	**420**	**600**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Clinical Optometry-I	BOP-201	06	03	30	70	100
2.	Basic of Computers	BOP-202	02	01	30	70	100
	Total		**08**	**04**	**60**	**140**	**200**

B.Optom Semester- III (Second Year)

Third Semester

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Ocular Microbiology	BOT-301	02	02	30	70	100
2.	Visual Optics-I	BOT-302	02	02	30	70	100
3.	Optometric Optics-I	BOT-303	02	02	30	70	100
4.	Optometric Instruments	BOT-304	02	02	30	70	100
5.	Ocular Disease-I	BOT-305	03	03	30	70	100
6.	Clinical Examination of Visual System	BOT-306	02	02	30	70	100
7.	Indian Medicine & Tele Medicine	BOT-307	02	02	30	70	100
	Total		**15**	**15**	**210**	**490**	**700**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Clinical Optometry-II	BOP-301	06	03	30	70	100
	Total		**06**	**03**	**30**	**70**	**100**

B.Optom Semester- IV (Second Year)

Fourth Semester

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Optometric Optics-II & Dispensing Optics	BOT-401	02	02	30	70	100
2.	Visual Optics-II	BOT-402	03	03	30	70	100
3.	Ocular Disease-II	BOT-403	03	03	30	70	100
4.	Pathology	BOT-404	02	02	30	70	100
5.	Basic & Ocular Pharmacology	BOT-405	03	03	30	70	100
6.	Introduction to Quality & Patient Safety	BOT-406	02	02	30	70	100
7.	Medical Psychology	BOT-407	02	02	30	70	100
	Total		**17**	**17**	**210**	**490**	**700**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Clinical Optometry-III	BOP-408	08	04	30	70	100
	Total		**08**	**04**	**30**	**70**	**100**

B. Optom Semester- V (Third Year)

Fifth Semester

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Contact Lens-I	BOT-501	03	03	30	70	100
2.	Low Vision Care	BOT-502	02	02	30	70	100
3.	Geriatric & Paediatric Optometry	BOT-503	03	03	30	70	100
4.	Binocular Vision-I	BOT-504	03	03	30	70	100
5.	Systemic Disease	BOT-505	03	03	30	70	100
6.	Research Methodology & Biostatistics	BOT-506	03	03	30	70	100
	Total		**17**	**17**	**180**	**420**	**600**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Clinical Optometry-IV	BOP-501	08	04	30	70	100
	Total		**08**	**04**	30	70	**100**

B.Optom Semester- VI (Third Year)

Sixth Semester

s.no.	Subjects (Theory)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Contact Lens-II	BOT-601	03	03	30	70	100
2.	Binocular Vision-II	BOT-602	03	03	30	70	100
3.	Public Health & Community Optometry	BOT-603	02	02	30	70	100
4.	Practice Management	BOT-604	02	02	30	70	100
5.	Occupational Optometry	BOT-605	02	02	30	70	100
6.	Optometric Law & Ethics	BOT-606	02	02	30	70	100
	Total		**14**	**14**	**180**	**420**	**600**

s.no.	Subjects (Practical)	Paper code	Hrs. per Week		Maximum Marks		
			Actual	Credit	I.A.	Exam	Total
1.	Clinical Optometry-V	BOP-601	08	04	30	70	100
2.	Research Project	BOP-603	03	03	30	70	100
	Total		**11**	**07**	**60**	**140**	**200**

FIFTH SEMESTER

COURSE/ PAPER-CONTACT LENS I

PAPER CODE- BOT-501

L	T	P	C
3	-	2	4

Learning objective: To enable the students to have knowledge in both theoretical and practical Aspects of Contact Lenses.

Learning Outcome-At the end of the course, the students will be able to understand the basics of Contact lens as well as its fitting and assessment.

UNIT 1

1. Introduction to Contact lenses
2. Definition and Classification
3. History of Contact Lenses
4. Optics of Contact Lenses
5. Magnification & Visual field
6. Accommodation & Convergence
7. Back & Front Vertex Power / Vertex distance calculation
8. Review of Anatomy & Physiology of Tear film
9. Cornea
10. Lids & Conjunctiva

UNIT 2

1. Introduction to CL materials
2. Monomers, Polymers
3. Properties of CL materials
4. Physiological (Dk, Ionicity, Water content)

5. Physical (Elasticity, Tensile strength, Rigidity)
6. Optical (Transmission, Refractive index)
7. Indications and contraindications
8. Parameters / Designs of Contact Lenses & Terminology

UNIT 3

1. RGP Contact Lens materials
2. Manufacturing Rigid and Soft Contact Lenses – various methods
3. Pre-Fitting examination – steps, significance, recording of results
4. Correction of Astigmatism with RGP lens

UNIT 4

1. Types of fit – Steep, Flat, Optimum – on spherical cornea with spherical lenses
2. Types of fit – Steep, Flat, Optimum – on Toric cornea with spherical lenses
3. Calculation and finalising Contact lens parameters
4. Ordering Rigid Contact Lenses – writing a prescription to the Laboratory
5. Checking and verifying Contact lenses from Laboratory

UNIT 5

1. Modifications possible with Rigid lenses
2. Common Handling Instructions
3. Insertion & Removal Techniques
4. Do's and Dont's
5. Care and Maintenance of Rigid lenses
6. Cleaning agent & Importance
7. Rinsing agents & Importance

8. Disinfecting agents & importance
9. Lubricating & Enzymatic cleaners
10. Follow up visit examination
11. Complications of RGP lenses

Practical

1. Measurement of Ocular dimensions
2. Pupillary diameter and lid characteristics
3. Blink rate and TBUT
4. Schrimer's test, Slit lamp examination of tear laye
5. Keratometry
6. Placido's disc
7. Soft Contact Lens fitting – Aspherical
8. Soft Contact Lens fitting – Lathecut lenses
9. Soft Contact Lens over refraction
10. Lens insertion and removal
11. Lens handling and cleaning
12. Examination of old soft Lens
13. RGP Lens fitting
14. RGP Lens Fit Assessment and fluorescein pattern
15. Special RGP fitting (Aphakia, pseudo phakia & Keratoconus)
16. RGP over refraction and Lens flexure
17. Examination of old RGP Lens
18. RGP Lens parameters

19. Slit lamp examination of Contact Lens wearers

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

Department of Optometry
Era University, Lucknow
Course Outline Effective From:
2023-24

Name of theProgram	**Bachelor of optometry**			**Year/ Semester:**	**5 th**
CourseName	**Contact lens-1**	**Course Code:**	**BOT501**	**Type:**	
Credits	**3**			**Total Sessions Hours:**	**60**
EvaluationSpread	**Internal Continuous Assessment:**			**End Term Exam:**	
Type ofCourse	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	1. Understand the basics of contact lenses 2. List the important properties of contact lenses 3. Finalise the CL design for various kinds patients 4. Recognize various types of fitting 5. Explain all the procedures to patient 6. Identify and manage the adverse effects of contact lens				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**The students to have knowledge in both theoretical and practical aspects of Contact Lenses.**
CO1	Understanding about contact lens history, introduction, design & relation with structure of eye.
CO2	Understanding about RGP contact lens material & their property their parameter.
CO3	Understanding about RGP contact lens manufacturing techniques & fitting of RGP lenses.
CO4	Understanding and know about care maintenance and do's & don't of RG P contact lens.
Pedagogy	Flipped classroom Class Rotation (Whole and Group) Differentiated Learning Contextual Learning
Internal Evaluation Mode	Class test+ weekly assignment Attendence Tutorial Role play Active learning

Unit NO.	**Title of the unit**	**Topic of unit** 2	**Hours**	**Mapped CO**
Unit 1	**INTRODUCTION TO CONTACT LENSES & OPTICS**	1. History of Contact lenses. 2. Related ocular anatomy and physiology. 3. Contact Lens materials, terminology, classification.	6	CO1

		4. Optics of Contact Lenses, comparison spectacles. 5. Indications and contraindications of Contact lenses. 6. Advantages and disadvantages of types of Contact lenses		
Unit 2	**CONTACT LENS MATERALS & PRE-FITTING.**	1. Introduction & types of RGP materials 2. Manufacturing Rigid Contact Lenses – various methods. 3. Pre-Fitting examination – steps, significance, recording of results. 4. Instruments used for examination and special Investigations in pre-fitting examinations. 5. Keratometry and Corneal topography. 6. Slit lamp examination. 7. Fitting philosophies of Contact Lenses – general outline. 8. Fitting Rigid Contact Lenses.	6	CO2
Unit 3	**CONTACT LENS FITTING & ASSESSMENT**	1. Insertion & removable of RGP 2. Using trial lenses – calculations involved. 3. Methods of assessment of Contact Lens fit- dynamic & static. 4. Types of fit – Steep, Flat, Optimum 5. Calculation and finalizing of Contact lens parameters. 6. Modifications possible with Rigid lenses.	6	CO3
Unit 4	**CARE AND MAINTENANCE OFRIGID LENSES**	1. Components of Lens Care systems for Rigid lenses. 2. Contact lens solutions – composition, necessity, advantages.	6	CO4
Unit 5	**HANDLING OF CONTACT LENSES**	1. Contact lens deposit, Complications. 2. Teaching the patient to insert and remove Rigid lenses. 3. Common handling instructions to first time wearers. 4. Special instructions to the patient wearing Rigid Gas Permeable Contact Lenses.	6	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO2	2	3	2	2	-	-	-	1	2	2	1	-	2	2
CO3	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO4	2	3	1	2	-	-	-	1	2	2	3	-	2	2

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

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
Reference Books	16. Contact Lenses – Dr. V.K. Dada. 17. Contact Lenses Practice - Robbert B. Mandell 18. Contact lens primer by Monica Chaudhary, Jaypee Brothers medical publishers (P) Ltd 19. IACLE Contact lens modules.
Para Text	**Unit 1:** **Unit 2:** **Unit 3:** **Unit4:**

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern

Mid Semester	12	12 marks theory(including MCQ, SHORT NOTE , LONG QUESTION)
Class Test	5	Short note
Online Test/ Objective Test	5	**MCQ**
Assignment/ Presentation	4	Assignment(2 MARKS) + Presentation(2MARKS)
Attendance	4	65-75 % 1 MARKS 75-85 2 MARKS 85-95 3 MARKS MORE THAN 95 % 4 MARKS
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

FIFTH SEMESTER

COURSE/ PAPER-LOW VISION CARE

PAPER CODE- BOT-502

L	T	P	C
2	-	2	3

Learning objective: To enable the students to have knowledge about epidemiology of visual impairment, types of low vision devices and its optical principles, clinical approach of the low vision patients, assistive devices for totally visually challenged, art of prescribing low vision devices and training the low vision patients.

UNIT 1

1. Definitions & classification of Low vision
2. Epidemiology of low vision
3. Model of low vision service

UNIT 2

1. Pre-clinical evaluation of low vision patients – prognostic & psychological factors; psycho-social impact of low vision
2. types of low vision aids – optical aids, non-optical aids & electronic devices
3. Optics of low vision aids

UNIT 3

1. Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction & training
2. Pediatric Low Vision care

UNIT 4

1. Low vision aids – dispensing & prescribing aspects

2. Visual rehabilitation & counselling

UNIT 5

1. Legal aspects of Low vision in India

2. Case Analysis

Practical 1:

1. Attending in low vision care clinic and history taking.

Practical 2:

1. Determining the type of telescope and its magnification (Direct comparison method & calculated method)
2. Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers**.**

Learning Outcome-At the end of the course, the student will be knowledgeable in the Clinical examination of Low vision subjects as well as prescribing Optical, Non-Optical, Electronic, and Assistive devices.

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.

REFERENCE BOOKS:

1. Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999

2. Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991

3. A J Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007.

4.

P

Department of Optometry

Era University, Lucknow

Course Outline

Effective From: 2023-24

Name of theProgram	**Bachelor of Optometry**			**Year/ Semester:**	**3rd/5th**
CourseName	**Low Vision Care**	**Course Code:**	**BOT502**	**Type:**	
Credits	**02**			**Total Sessions Hours:**	**30**
EvaluationSpread	**Internal Continuous Assessment:**	**30**		**End Term Exam:**	**70**
Type ofCourse	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	The objective of the course is to provide the students with the knowledge of low vision classification, social impact on the low vision patients, examination of low vision, basic concept of low vision devices and the management options for the low vision patients.				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	At the end of the course, the students will be able to understand about low vision classification, evaluation and the management of low vision patients.
CO1	Understanding the concept of low vision and the models of low vision.
CO2	Understanding the concept of clinical evaluation of the low vision patients.
CO3	Applying concept of magnification associated with the low vision devices and their importance.
CO4	Understanding the basic concept of dispensing and prescribing aspects in low vision.
CO5	Understanding the basic concept of legal aspects of low vision in India and the case studies of low vision.
Internal EvaluationMode	Class test+ weekly assignment Attendence Tutorial Role play Active learning

Unit NO.	**Title of the unit**	**Topic of unit**	**Hours**	**Mapped CO**
Unit 1	**CLASSIFICATION OF LOW VISION**	17. Definitions of low vision 18. Epidemiology of low vision 19. Model of low vision services	6	CO1
Unit 2	**CLINICAL EXAMINATION OF LOW VISION PATIENTS**	1. Pre-clinical evaluation of low vision patients 2. Prognostic factor associated with low vision 3. Psychological impact on low vision 4. Psycho-social impact on low vision	6	CO2
Unit 3	**LOW VISION DEVICES &**	38. Optics of low vision devices 39. Selection of low vision devices	6	CO3

	MAGNIFICATIONS	40. Instruction and training aspects		
Unit 4	**DISPENSING & PRESCRIBING ASPECTS OF LOW VISION**	28. Dispensing aspects of low vision devices 29. Visual rehabilitation 30. Counseling of low vision patients	6	CO4
Unit 5	**LEGAL ASPECTS OF LOW VISION & CASE ANALYSIS**	25. Legal aspects of low vision in India. 26. Different types of low vision case analysis	6	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	3	-	-	1	2	1	2	1	1	2
CO2	2	3	2	2	3	-	-	1	2	2	1	2	2	2
CO3	1	3	1	2	3	-	-	1	2	1	2	2	1	2
CO4	2	3	1	2	3	-	-	1	2	2	3	1	2	2

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

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.
Reference Books	20. Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999 21. Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991 22. A J Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007.

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	12 Marks theory(including MCQ, SHORT NOTE , LONG QUESTION)
Class Test	5	Short note
Online Test/ Objective Test	5	**MCQs**
Assignment/ Presentation	4	Assignment(2 MARKS) + Presentation(2MARKS)
Attendance	4	65-75 % 1 MARKS 75-85 2 MARKS 85-95 3 MARKS >95 % 4 MARKS
Total Marks	**30**	

Course created by: SALAL MOHAMMAD (AP)

Signature:

Approved by:

Signature:

P

FIFTH SEMESTER

COURSE/ PAPER -GERIATRIC OPTOMETRY & PEDIATRIC OPTOMETRY

PAPER CODE- BOT-503

L	T	P	C
3	-	2	4

Learning Objective-The objective of the course is to provide the students with the knowledge of general and ocular physiological changes of ageing, common geriatric systemic and ocular diseases, clinical approach of geriatric patients and spectacle dispensing aspects in ageing patients as well as the development of the eye and vision, vision assessment and management of vision disorder in pediatric patients.

Learning Outcome-At the end of the course, the students will be able to examine and manage pediatric as well as geriatric patients.

UNIT 1

1. Structural , and morphological changes of eye in elderly
2. Physiological changes in eye in the course of aging.
3. Introduction to geriatric medicine – epidemiology , need for optometry care, systemic diseases (Hypertension, Atherosclerosis, coronary heart disease, congestive Heart failure, Cerebrovascular disease, Diabetes, COPD)
4. Optometric Examination of the Older Adult
5. Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders, vascular diseases of the eye

UNIT 2

1. Contact lenses in elderly
2. Pharmacological aspects of aging
3. Low vision causes, management and rehabilitation in geriatrics.
4. Spectacle dispensing in elderly – Considerations of spectacle lenses and frames

UNIT 3

- The Development of Eye and Vision

- History taking Paediatric subjects
- Assessment of visual acuity
- Normal appearance, pathology and structural anomalies of
- Orbit, Eye lids, Lacrimal system,
- Conjunctiva, Cornea, Sclera Anterior chamber, Uveal tract, Pupil
  Lens, vitreous, Fundus Oculomotor system
- Refractive Examination

UNIT 4

- Determining binocular status
- Determining sensory motor adaptability
- Compensatory treatment and remedial therapy for : Myopia, Pseudomyopia, Hyperopia, Astigmatism, Anisometropia, Amblyopia
- Remedial and Compensatory treatment of Strabismus and Nystagmus
- Paediatric eye disorders: Cataract, Retinopathy of Prematurity, Retinoblastoma, Neuromuscular conditions (myotonic dystrophy, mitochondrial cytopathy), and Genetic.

UNIT 5

- Anterior segment dysgenesis, Aniridia, Microphthalmos, Coloboma, Albinism
- Spectacle dispensing for children
- Paediatric contact lenses
- Low vision assessment in children

Practical

Deals with hand-on session the different geriatric and pediatric evaluation techniques.

TEXT BOOKS:

1. A.J. ROSSENBLOOM Jr & M.W.MORGAN: Vision and Aging, Butterworth-Heinemann, Missouri, 2007.
2. Pediatric Optometry - JEROME ROSNER, Butterworth, London 1982

3. Paediatric Optometry –William Harvey/ Bernard Gilmartin, Butterworth – Heinemann, 2004

REFERENCE 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
4. Binocular Vision and Ocular Motility - VON NOORDEN G K Burian Von Noorden's, 2nd Ed., C.V. Mosby Co. St. Louis, 1980
5. Assessing Children's Vision. By Susan J Leat, Rosalyn H Shute, Carol A Westall.45 Oxford: Butterworth-Heinemann, 1999.
6. Clinical pediatric optometry. LJ Press, BD Moore, Butterworth- Heinemann, 1993
7. Department of Liberal EducationEra University, Lucknow

Course Outline Effective From:

2023-24

Name of theProgram	**Bachelor of optometry**			**Year/ Semester:**	**5 th**
CourseName	**Geriatric Optometry & Pediatric Optometry**	**Course Code:**	**BOT503**	**Type:**	
Credits	**45**			**Total Sessions Hours:**	**45**
EvaluationSpread	**Internal Continuous Assessment:**			**End Term Exam:**	
Type ofCourse	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	The objective of the course is to provide the students with the knowledge of general and ocular physiological changes of ageing, common geriatric systemic and ocular diseases, clinical approach of geriatric patients and spectacle dispensing aspects in ageing patients as well as the development of the eye and vision, vision assessment and management of vision disorder in pediatric patients.				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	At the end of the course, the students will be able to examine and manage pediatric as well as geriatric patients
CO1	Understanding the concept of structural and functional changes in elderly eye.
CO2	Understanding the concept of systemic diseases of geriatric and pediatric patients.
CO3	Applying concept of optometric Evaluation procedure in children and elderly patients.
CO4	Understanding the concept of ocular drainage and other mechanical systems in children and elderly patients.
Pedagogy	Flipped classroom Class Rotation (Whole and Group) Differentiated Learning Contextual Learning
Internal Evaluation Mode	Class test+ weekly assignment Attendence Tutorial Role play Active learning

Unit NO.	**Title of the unit**	**Topic of unit**	**Hours**	**Mapped CO**
Unit 1	**OCULAR COMPLICATION**	20. Structural changes in eye. 21. Physiological changes in eye. 22. Optical and refractive changes in eye.	9	CO1
Unit 2	**GERIATRIC OCULAR COMPLICATION**	3. Ocular diseases common in old age, with special reference to ARMD, cataract, glaucoma, macular disorders, vascular diseases.	9	CO2
Unit 3	**GERIATRIC DISPENSING**	41. Low vision causes, management and rehabilitation in geriatrics. 42. Spectacle dispensing in elderly–Considerations of spectacle lenses and frames	9	CO3

Unit 4	**PEDIATRIC DEVELOPMENT**	31. The Development of Eye and Milestone. 32. History taking Pediatric Optometry. 33. Assessment of visual acuity and determining binocular status	9	CO4
Unit 5	**PEDIATRIC OCULAR COMPLICATION**	27. Normal appearance, pathology and structural anomalies of Orbit, Eye lids, Lacrimal system, Conjunctiva, Cornea, Anterior chamber, Uveal tract, Pupil. 28. Pediatric eye disorders: Ophthalmia Neonatorum, Cataract, Retinopathy of Prematurity, Retinoblastoma.	9	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO2	2	3	2	2	-	-	-	1	2	2	1	-	2	2
CO3	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO4	2	3	1	2	-	-	-	1	2	2	3	-	2	2

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	A.J. ROSSENBLOOM Jr & M.W.MORGAN: Vision and Aging, Butterworth-Heinemann, Missouri, 2007.
Reference Books	23. Clinical Geriatric Eye Care – Sheree Aston, Joseph Maino – Butterworth Heinemann. 24. Pediatric Optometry –William Harvey/Bernard Gilmartin, Butterworth – Heinemann, 2004. 25. OP Sharma: Geriatric Care–A text book of geriatrics and Gerontology, Viv books, NewDelhi,2005. 26. VS Natarajan: An update on Geriatrics, Sakthi Pathipagam, Chennai,1998 27. DE Rosenblatt, VS Natarajan: Primer on geriatric Care A clinical approach to the older patient, Printers Castle, Cochin,2002 28. Binocular Vision and Ocular Motility-VON NOORDEN G K Burien Von Noorden's, 2nd Ed., C.V. Mosby Co. St. Louis,1980 29. Assessing Children's Vision. By Susan J Leat, Rosalyn H Shute, Carol AWestall.45 Oxford: Butterworth-Heinemann,1999.
Para Text	**Unit 1:** **Unit 2:** **Unit 3:** **Unit4:**

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	12 marks theory(including MCQ, SHORT NOTE , LONG QUESTION)
Class Test	5	Short note
Online Test/ Objective Test	5	**MCQ**
Assignment/ Presentation	4	Assignment(2 MARKS) + Presentation(2MARKS)
Attendance	4	65-75 % 1 MARKS 75-85 2 MARKS 85-95 3 MARKS

		MORE THAN 95 % 4 MARKS
Total Marks	**30**	

Course created by: Mr. Jamshed Ali (AP) **Signature:**	**Approved by:** **Signature:**

FIFTH SEMESTER

COURSE/ PAPER -BINOCULAR VISION- I

PAPER CODE- BOT-504

L	T	P	C
3	-	-	3

Learning objective- The objective of the course is to provide the students the basics of Binocular Vision and its clinical co-relation.

Learning Outcome-At the end of the course, the students will be able to demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extra ocular muscles as well as the etiology, investigation and management of anomalies of binocular vision.

UNIT 1

- Binocular Vision and Space perception. Relative subjective visual direction
- Retino motor value
- Grades of BSV - SMP and Cyclopean Eye Correspondence,
- Fusion, Diplopia, Retinal rivalry Horopter
- Physiological Diplopia and Suppression
- Stereopsis, Panum's area, BSV.
- Stereopsis and monocular clues - significance.
- Egocentric location, clinical applications.
- Theories of Binocular vision.

UNIT 2

- Anatomy of Extra Ocular Muscles. Rectii and Obliques, LPS
- Innervation & Blood Supply
- Physiology of Ocular movements.
- Center of rotation, Axes of Fick.
- Action of individual muscle.

- Laws of ocular motility
- Sherrington's law
- Hering's law
- Uniocular& Binocular movements - fixation, saccadic & pursuits.
- Version &Vergence.
- Fixation & field of fixation

UNIT 3

- Near Vision Complex Accommodation
- Definition and mechanism (process).
- Methods of measurement.
- Stimulus and innervation.
- Types of accommodation.
- Anomalies of accommodation – aetiology and management.

UNIT 4

- Convergence
- Definition and mechanism.
- Methods of measurement.
- Types and components of convergence - Tonic, accommodative, fusional, proximal Anomalies of Convergence – aetiology and management.
- Sensory adaptations
- Confusion

UNIT 5

- Suppression- investigation and management
- Blind spot syndrome

- Abnormal Retinal Correspondence
- Investigation and management
- Blind spot syndrome
- Eccentric Fixation-investigation and management
- Amblyopia-classification, etiology, investigations and management.

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

Department of Optometry

Era University, Lucknow

Course Outline Effective From:

2023-24

Name of the Program	**B.Sc. (OPTOMETRY)**			**Year/ Semester:**	**1st Semester**
Course Name	**BINOCULAR VISION-I**	**Course Code:**	**BOT504**	**Type:**	**Theory**
Credits	**04 (L-3, T-1, P-0)**			**Total Sessions Hours:**	**40 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	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 Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	The candidate should demonstrate fundamental knowledge & insight into geometrical optics in order for the candidate to be able to understand & solve problems related to the eye & optical instrument/lenses their function & correction.				
	Attributes				
CO1	Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extraocular muscles.				
CO2	Knowledge & understanding should be demonstrated an in- depth various binocular vision anomalies, its diagnostic approaches and management.				
CO3	Provide a detailed explanation of, and differentiate between the etiology, investigation andmanagement of binocular vision anomalies.				
CO4	Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.				
CO5	To Knowledge of the fundamentals of geometrical optics & how they apply to the human eye.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 12 Marks Class test((Participation): 04 Marks Class Presentation : 04 Marks Assignments/Presentation: 04 Marks Attendance: 04 Marks Bed side Behavior: 02 Marks				
Session Details	**Topic**			**Hours**	**Mapped CO**

Unit 1	1. Binocular Vision and Space perception. Relative subjective visual direction 2. Retino motor value 3. Grades of BSV - SMP and Cyclopean Eye Correspondence, 4. Fusion, Diplopia, Retinal rivalry Horopter 5. Physiological Diplopia and Suppression 6. Stereopsis, Panum's area, BSV. 7. Stereopsis and monocular clues - significance. 8. Egocentric location, clinical applications. 9. Theories of Binocular vision.	8	CO1
Unit 2	1. Anatomy of Extra Ocular Muscles. Rectii and Obliques, LPS 2. Innervation & Blood Supply 3. Physiology of Ocular movements. 4. Center of rotation, Axes of Fick. 5. Action of individual muscle. 6. Laws of ocular motility 7. Sherrington's law, Hering's law, Uniocular& Binocular movements - fixation, saccadic & pursuits. 8. Version &Vergence, Fixation & field of fixation	10	CO2
Unit 3	1. Near Vision Complex Accommodation 2. Definition and mechanism (process). 3. Methods of measurement. 4. Stimulus and innervation. 5. Types of accommodation. 6. Anomalies of accommodation – aetiology and management.	8	CO3
Unit 4	1. Convergence,Definition and mechanism Methods Of measurement. 2. Types and components of convergence - Tonic, accommodative, fusional, proximal Anomalies of Convergence – aetiology and management. 3. Sensory adaptations 4. Confusion	6	CO4
Unit 5	Suppression- investigation and management Blind spot syndrome Abnormal Retinal Correspondence, Investigation and management Blind spot syndrome Eccentric Fixation-investigation and management Amblyopia-classification, etiology, investigations and management	8	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	1	-	1	-	-
CO2	1	3	1	3	-	-	-	1	3	2	-	2	-	-
CO3	1	3	1	2	-	-	-	1	3	1	-	1	-	-

CO4	**1**	**3**	**1**	**2**	**-**	**-**	**-**	**1**	**2**	**1**	**-**	**1**	**-**	**-**
CO5	**1**	**3**	**1**	**2**	**-**	**-**	**-**	**1**	**2**	**1**	**-**	**1**	**-**	**-**

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

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. 5.Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers
Reference Books	1.Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers. 2.Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester :	12	**Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ Each question carries **04 Marks.** **Section B:** Contains **02** Short questions out of which **03** questions are to be attempted. Each question carries **02 Marks**. **Section C:** Contains **01**descriptive questions are to be attempted & Question carries **04 Marks**
Class Test :	04	Contains **05 descriptive questions.** Each question carries **04** Mark.
Class Presentation :	04	Contains **10 multiple choice questions.** Each question carries **1**
		Marks.
Assignment/ Presentation :	04	Assignment to be made on topics and instruction given by subject teacher
Attendance :	04	As per policy
Bed side Behavior :	02	As per policy
TOTAL	30	

Course Created by:- Mrs. Namrata Srivastava
Assistant Professor

Signature :

Course Approved by:- Mr. Sunil Kumar Gupta
Asst. Prof. & Icharge

Signature :

FIFTH SEMESTER

COURSE/ PAPER -SYSTEMIC DISEASES

PAPER CODE- BOT-505

L	T	P	C
3	-	-	3

Learning 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.

Learning Outcome- At the end of this course the student will be able to manage the ocular manifestation of various systemic diseases

UNIT 1

Hypertension-Definition, classification, Epidemiology, clinical examination, complications, and managemen, Hypertensive retinopathy

Diabetes Mellitus--Classification, path physiology, clinical presentations, diagnosis, and management, Complications**,** Diabetic Retinopathy

Thyroid Disease--Physiology, testing for thyroid disease, Hyperthyroidism, Hypothroidism, Thyroiditis, Thyroid tumors**,** Grave's Ophthalmopathy

Acquired Heart Disease-Ischemic Heart Disease, Congestive heart failure, Disorders of cardiac rhythm**,** Ophthalmic considerations

UNIT 2

Cancer: Incidence**,** Etiology**,** Therapy**,** Ophthalmologic, considerations

Connective Tissue Disease- Rheumatic arthritis**,** Scleroderma**,** Sjogren syndrome**,** Behcet's syndrome**,** Eye and connective tissue disease

Tuberculosis- Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment tuberculosis and the eye.

UNIT 3

Herpes virus (Herepes simplex, Varicella Zoster, Cytomegalovirus), Herpes and the eye Hepatitis (Hepatitis A, B, C) Acquired Immunodeficiency Syndrome

UNIT 4

Anemia (Diagnosis, clinical evaluation, consequences, Sickle cell disease, treatment,

Ophthalmologic considerations)

Common Tropical Medical Ailments

- Malaria
- Typhoid
- Dengue
- Onchocerciasis
- Cysticercosis
- Leprosy
- Nutritional and Metabolidisorders:

- Kwashiorkor
- Vitamin Deficiency
- Myasthenia Gravis

UNIT 5

First Aid Genetics-Introduction to genetics, Chromosome structure and cell division, Gene structure and basic principles of Genetics, Genetic disorders and the eye

TEXT BOOKS:

1. 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

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

Department of Optometry
Era University, Lucknow
Course Outline Effective
From:2023-24

Name of the Program	**Bachelor of optometry**			**Year/Semester:**	**5 th**
CourseName	**Systemic diseases**	**Course Code:**	**BOT505**	**Type: Semester**	
Credits	**15**			**Total Sessions Hours:**	**15**
Evaluation Spread	**Internal Contineuous Assessment:**			**End Term Exam:**	
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	The course deals with definition, classification, clinical diagnosis complication and managements of various systemic diseases. In indicated cases ocular manifestations also will we discussed.				

Course Outcomes(CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome(CO)	
CO1	Understanding the concept of pathological changes in the eyes with systemic diseases such as hypertension, diabetes mellitus, thyroid diseases, acquired heart diseases.
CO2	To know the pathological changes occurs in the eyes with systemic diseases such as connective tissues diseases, cancer and tuberculosis.
CO3	To understand the causes of and evaluation of herpes virus in the eyes.
CO4	To understand ophthalmological consideration with infectious diseases such as typhoid, malaria, dengue, leprosy, anemia and other nutritional and metabolic disorder such as kwashiorkor, vitamin deficiency and myasthenia gravis.
CO5	To understand the concept of Genetic disorders and the eye
Pedagogy	Flipped classroom Class Rotation (Whole and Group) Differentiated Learning Contextual Learning
Internal Evaluation Mode	Class test+ weekly assignment Attendence Tutorial Role play Active learning

UnitNO.	**Title of the unit**	**Topic of unit**	**Hours**	**Mapped CO**

Unit1	**1-Hypertension-** **2- Diabetes Mellitus—** **3- Thyroid Disease—** **4- Acquired Heart Disease-**	- Definition, classification, Epidemiology, clinical examination, complications, and management, Hypertensive retinopathy - Classification, path physiology, clinical presentations, diagnosis, and management, Complications**,** Diabetic Retinopathy - Physiology, testing for thyroid disease, Hyperthyroidism, Hypothroidism,Thyroiditis, Thyroid tumors**,** Grave's Ophthalmopathy - Ischemic Heart Disease, Congestive heart failure, Disorders of cardiac rhythm**,** Ophthalmic considerations.	3	CO1
Unit2	**1-Cancer:** **2- Connective Tissue Disease** **3- Tuberculosis-**	- Incidence**,** Etiology**,** Therapy**,** Ophthalmologic, considerations - - Rheumatic arthritis**,** Scleroderma**,** Sjogren syndrome**,** Behcet's syndrome**,** Eye and connective tissue disease - Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment tuberculosis and the eye.	3	CO2
Unit3	**Herpes virus**	- Herpes virus (Herepes simplex, Varicella Zoster, Cytomegalovirus), Herpes and the eye Hepatitis (Hepatitis A, B, C)Acquired Immunodeficiency Syndrome	3	CO3
Unit4	**1-Anemi** **2- Common Tropical Medical Ailments** **3-Nutritional and Metabolidisorders:**	- Diagnosis, clinical evaluation, consequences, Sickle cell disease, treatment, Ophthalmologic considerations • Malaria • Typhoid • Dengue • Onchocerciasis • Cysticercosis • Leprosy • Kwashiorkor • Vitamin Deficiency • Myasthenia Gravis	3	CO4
Unit 5	**First AidGenetics-**	- Introduction to genetics, Chromosome structure and cell division, Gene structure andbasic principles of Genetics, Genetic disorders and the eye	3	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO2	2	3	2	2	-	-	-	1	2	2	1	-	2	2
CO3	1	3	1	2	-	-	-	1	2	1	2	-	1	2
CO4	2	3	1	2	-	-	-	1	2	2	3	-	2	2

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text-Books	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
Reference Books	3. Basic and clinical Science course: Update on General Medicine, American Academy of Ophthalmology, Section 1, 1999 30.
Para Text	**Unit1:** **Unit2:** **Unit3:** **Unit4:** **Unite5;**

Recapitulation &Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	12 marks theory(including MCQ, SHORT NOTE , LONG QUESTION)
ClassTest	5	Short note
Online Test/Objective Test	5	**MCQ**
Assignment/Presentation	4	Assignment(2 MARKS) +Presentation(2MARKS)
Attendance	4	65-75 % 1 MARKS 75-85 2 MARKS 85-95 3 MARKS MORE THAN 95 % 4 MARKS
Total Marks	**30**	

Course created by: Mr. Jamshed Ali (AP)

Signature:

Approved by:

Signature:

FIFTH SEMESTER

COURSE/ PAPER -RESEARCH METHODOLOGY & BIOSTATISTICS

PAPER CODE- BOT-506

L	T	P	C
3	**-**		3

Learning 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.

Learning outcome- At the end of the course the student will be aware of the basic research methodology, collection and analysis of data.

UNIT 1

- Introduction to research methods
- Identifying research problem

UNIT 2

- Ethical issues in research
- Research design

UNIT 3

- Types of Data
- Research tools and Data collection methods

UNIT 4

- Sampling methods
- Developing a research proposal

UNIT 5

Introduction of Biostatistics- Measures of Morality, Sampling, Statistical significance, Correlation, Sample size determination.

Collection of Data - presentation including classification and diagrammatic representation frequency distribution. Measures of central tendency; measures of dispersion. Theoretical distributions. Binomial , Normal Sampling –necessity of methods and techniques.

Chi. Square test (2 x 2) Hospital Statistics Use of computerized software for statistics.

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

Department of Optometry
Era University, Lucknow

Course Outline
Effective From:2023-24

Name of the Program	**Bachelor of optometry**			**Year/Semester:**	**3rd/5th**
Course Name	**Research Methodology & Biostatistics**	**Course Code:**	**BOT-506**	**Type:**	Regular
Credits	**3**			**Total Sessions Hours:**	**45**
Evaluation Spread	**Internal Continuous Assessment:**	**30**		**End Term Exam:**	**70**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	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 Outcomes (CO): At the end of the course the student will be aware of the basic research methodology, collection and analysis of data.

Course Outcome(CO)	
CO1	Understanding about basic concepts of research methods.
CO2	Understanding about ethical issues in research
CO3	Understanding about research data and research tools
CO4	Learn about the sampling techniques in research
CO5	Understanding about the basic concepts of biostatistics
Pedagogy	Flipped classroom Class Rotation (Whole and Group) Differentiated Learning Contextual Learning
Internal Evaluation Mode	Class test+ weekly assignment Attendance Tutorial Role play Active learning

Unit NO.	**Title of the unit**	**Topic of unit**	**Hours**	**Mapped CO**

Unit1	**INTRODUCTION OF RESEARCH**	1. Basic concepts of research methods 2. Identifying research problem	6	CO1
Unit2	**ETHICAL ISSUES IN RESEARCH METHODOLOGY**	1. Ethical issues in research 2. Research design: Observational & Analytical	6	CO2
Unit3	**BASIC OF RESEARCH DATA**	1. Types of Data 2. Research tools 3. Data collection methods	6	CO3
Unit4	**SAMPLING TECHNIQUES & RESEARCH PROPOSAL**	1. Introduction of Sampling methods 2. Types of sampling data 3. Developing a research proposal	6	CO4
Unit 5	**INTRODUCTION OF BIOSTATISTICS**	1. **Introduction of Biostatistics-** Measures of Morality, Sampling, Statistical significance, Correlation, Sample size determination. **2.** Collection of Data - presentation including classification and diagrammatic representation frequency distribution. Measures of central tendency; measures of dispersion. Theoretical distributions. Binomial, Normal Sampling – necessity of methods and techniques. Chi. Square test (2 x 2) Hospital Statistics Use of computerized software for statistics.	6	CO5

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	2	1	1	1	2
CO2	1	3	2	2	-	-	-	1	2	2	1	1	1	2
CO3	1	3	1	2	-	-	-	1	2	1	1	1	1	2
CO4	2	3	1	2	-	-	-	1	2	2	1	1	1	2
CO5	1	3	1	2	-	-	-	1	2	1	1	1	1	2

Strong contribution-3, ***Average contribution-2,*** ***Low contribution-1,***

Suggested Readings:

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
Reference Books	

Recapitulation &Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
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Attendance	4	65-75 % 1 MARKS 75-85 2 MARKS 85-95 3 MARKS MORE THAN 95 % 4 MARKS
Total Marks	**30**	

Course created by: Ragni Kumari **Signature:**	**Approved by:** **Signature:**

FIFTH SEMESTER

COURSE/ PAPER – CLINICAL OPTOMETRY - IV

Course code BOP-501 **Credit: 4**

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

Module: I

Unit Of competency: Contact lens -1.

- The ability to select and fit the most appropriate lens for the planned use
- The ability to Identify and manage after care

Elements of competence:

1.Recognize Contact lens types and material.

2.Pre fitting evaluation

3. Demonstrates an understanding of the range of rigid lens material and designs available

4. Appropriate choice of rigid lens parameter.

5. Fitting philosophies of rigid lens and fitting assessment.

6.Demonstrates an understanding of the type of astigmatism which require correction.

7.RGP lens adaptation

8.RGP lens wear and care including use of RGP lens care product.

9.Demonstrates an understanding of the range of soft lens materials and design available.

10.appropriate choices of soft lens , Fitting philosophies and fitting assessment.

11. Write appropriate order form for RGP and soft lenses

12. Instruct patient the technique of RGP, soft lens insertion, removal and other relevant handling instructions.

Modlue: II

Unit Of competency: Assessment of Binocular vision

- ❖ The ability to assess the patient with anomalies of binocular vision
- ❖ The ability to asses binocular status using objective and subjective means

Elements of competence:

1. Understand the different objective test available to asses deviation. E.g. cover & motility test
2. Different subjective test available to assess subjective deviation. E.g. fixation disparity
3. Identification of phoria and tropia
4. Measurement of fusional vergence range dist and near
5. Measureent of accommodative facility
6. Measurement of stereopsis
7. AC/A ratio (heterophoria and gradient method)
8. Synoptophore:
   - Measurement of SMP, FUSION And stereopsis
   - Angle of anomaly
   - ARC

Module III:

Unit of competency: Low vision and rehabilitation:

- ❖ The ability to assess a patient with low vision
- ❖ The ability to advice, refer and provide after care to low vision patients
- ❖ The ability to refer low vision Patients to other agencies where appropriate

Elements of competence:

1. Distance and near vision chart used for low vision
2. Assessment of visual function, including the use of Log MAR and other specialist charts, effects of illumination, contrast and glare.
3. Assessment of visual field of patient with reduced vision.
4. VA criteria for visual impairment, Low vision and visually handicap
5. Indication of binocular low vision aids
6. Knowledge of Optical and non optical devices
7. Identification of patients visual needs
8. Sign and symptoms of ocular and systemic pathologies.

9. Assessment of magnification for distance and near vision
10. Selection of Optical aids for distance and near.
11. Advises on the use of, and dispenses simple low vision aids :
    - Identifies which patients would benefit from low vision aids and advice ,

- Understands the principles of magnification,
- Field of view and working distance in relation to different aids Provides advice on the advantages and disadvantages of different types of simple low vision aids ,
- Understands the mechanisms of prescribing magnification including acuity reserve ,
- Gives correct instruction to a patient in the use of various aids, to include: Which specs to use with aid, Lighting required, Appropriate working distance

12. Training in use of aids

13.Low vision rehabilitation

Module IV:

Unit of competency: Community Visit.

- ❖ The ability to screen refractive error and knowledge of eye health disordered in community
- ❖ The ability to impart information in a manner which is appropriate to the recipients.

Elements of competence:

1.School screening

2.Industrial Eye screening

3.Community eye services.

Evaluation Scheme:

Attendance	Record file	Written test	Viva	Practical	Total
5	15	30	30	20	**100**

<u>Text book</u>/ Reference Book

- Grosvenor, Primary Care Optometry , Butterworth-Heinemann,
- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007
- D B. Elliott :Clinical Procedures in Primary Eye Care,3rd edition, Butterworth-Heinemann, 2007
- BHVI modules