# 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:**
**www.erauniversity.in**

# 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<br>General<br>Specific<br>Conditions | 5 |
| 4 | Visual Acuity – Distance + Near<br>( log MAR)<br>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<br>Direct<br>Consensual<br>RAPD | 5 |
| 25 | Maddox rod (Phoria) | 5 |

| | | |
|---|---|---|
| 26 | Retinoscopy-<br>Static, Dynamic and<br>Cycloplegic Retinoscopy | 5 |
| 27 | Keratometry | 5 |
| 28 | Subjective Refraction<br>JCC<br>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<br>(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** |

# FOURTH SEMESTER

## COURSE/ PAPER- OPTOMETRIC OPTICS II & DISPENSING OPTICS

**SUBJECT CODE- BOT-401**

| L | T | P | C |
|---|---|---|---|
| 2 | - | 2 | 3 |

**Learning objective-**The objective is to equip the students with through knowledge of different types, materials, tints, properties, coating of spectacle lenses as well as different frames.

**Learning Outcome**- At the end of the course, the students will be able to dispense different lens according to the requirement as well as perform facial measurement and marking related to dispensing optics.

**UNIT -1**

- Spectacle Lenses
- Manufacture of glass
- Lens materials
- Lens surfacing
- Principle of surface generation and glass cements
- Terminology used in Lens workshop
- Lens Quality
- Lens properties
- Methods of Inspecting the quality of lenses

**UNIT -2**

- Spectacle Frames
- Types and part

- Classification of spectacle frames-material, weight, temple position
- Coloration
- Frame selection
- Frame & lens measurements and selection

**UNIT – 3**

- Tinted & Protective Lenses
- Characteristics of tinted lenses Absorptive Glasses
- Safety lenses-Toughened lenses, Laminated Lenses, CR 39 Polycarbonate Lenses
- Reflection from spectacle lenses - ghost images

**UNIT – 4**

- Multifocal Lenses- Introduction, history and development, types
- Bifocal lenses, Trifocal & Progressive addition lenses
- Reflections in bifocals at the dividing line
- Marking and measurement in dispensing optics.

**UNIT – 5**

- Antireflection coating, Mirror coating, Hard Multi Coating [HMC],
- Spectacle magnifiers
- Lenticular & Aspherical lenses
- Special types of spectacle
- Industrial safety glasses
- Frame availability in Indian market
- Soft skills and professional communication with Patient and Customers

## Practical

1. Find out the meridian & optical center of ophthalmic lens ,
2. Neutralization – manual & help of Lensometer
3. Identification of lens-spherical, cylindrical & sphero-cylindrical lenses ,
4. Lens-surfacing & edging, cutting & marking of single vision bifocal progressive
5. Frame measurement: The boxing system, the datum system. Comparison of the two systems, Lens position, segment specification,
6. Frame selection: Fashion, Function & standard alignment ,
7. Lens selection: Ground rule for selection, selection criteria,
8. Facial measurements: The PD, Visual axes, & measuring inter-Pupillary distance using P.D ruler., Common difficulties in measuring P.D, Measuring monocular P.D, measuring near C.D. , Measuring heights :- single vision , bifocal, multifocal, progressive,
9. Pediatric dispensing.

**TEXT BOOK/REFERENCE BOOKS:**


1. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth –Heinemann, 2008
2. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996
3. C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rdedition, Butterworth - Heinemann, 2007
4. Michael P Keating: Geometric, Phisical& Visual Optics, 2nd edition, Butterworth – Heinemann, 2002

Department of OPTOMETRY

Era University, Lucknow

Course Outline

**Effective From: 2024-25**

| | | | | | |
|---|---|---|---|---|---|
| **Name of the Program** | **B.Sc. (OPTOMETRY)** | | | **Year/ Semester:** | **2nd Year/4th Semester** |
| **Course Name** | **OPTOMETRIC OPTICS II & DISPENSING OPTICS** | **Course Code:** | **BOT-401** | **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** | • The objective is to equip the students with through knowledge of different types, materials, tints, properties, coating of spectacle lenses as well as different frames.<br>• At the end of the course, the students will be able to dispense different lens according to the requirement as well as perform facial measurement and marking related to dispensing optics. |
| **Course Outcomes (CO):** *After the successful course completion, learners will develop following attributes:* | |
| **Course Outcome (CO)** | Students learn the fundamental principles of optics, such as refraction, lens properties, and vision correction techniques. This knowledge forms the foundation for effectively dispensing optical solutions.. |
| | **Attributes** |
| **CO1** | Dispensing optics courses aim to equip students with the practical skills necessary to accurately interpret prescriptions and fit patients with appropriate eyewear. |
| **CO2** | Students learn the fundamental principles of optics, such as refraction, lens properties, and vision correction techniques. |
| **CO3** | Students gain comprehensive knowledge about various optical products, including lenses, frames, and coatings. |
| **CO4** | Understanding the features and benefits of different products enables them to make informed recommendations based on individual requirements |
| **CO5** | Dispensing optics courses emphasize the importance of adhering to ethical standards and legal regulations in the field. |
| **Pedagogy** | Interactive, discussion-bases, student-centered, presentation. |
| **Internal Evaluation Mode** | Mid-term Examination: 12 Marks Class test((Participation): 04 Marks<br>Class Presentation : 04 Marks<br>Assignments/Presentation: 04 Marks<br>Attendance: 04 Marks<br>Bed side Behavior: 02 Marks |

| **Session Details** | **Topic** | **Hours** | **Mapped CO** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Unit 1** | 5. Spectacle Lenses<br>6. • Manufacture of glass<br>7. • Lens materials<br>8. • Lens surfacing<br>9. • Principle of surface generation and glass cements<br>10. • Terminology used in Lens workshop<br>11. • Lens Quality<br>12. • Lens properties<br>13. • Methods of Inspecting the quality of lenses.. | 06 | CO1 |
| **Unit 2** | 6. Spectacle Frames<br>7. • Types and part<br>8. Classification of spectacle frames-material, weight, temple position<br>9. • Coloration<br>10. • Frame selection<br>11. • Frame & lens measurements and selection | 10 | CO2 |
| **Unit 3** | 3. Tinted & Protective Lenses<br>4. • Characteristics of tinted lenses Absorptive Glasses<br>5. • Safety lenses-Toughened lenses, Laminated Lenses, CR 39<br>6. Polycarbonate Lenses<br>7. • Reflection from spectacle lenses - ghost images | 10 | CO3 |
| **Unit 4** | 2. Multifocal Lenses- Introduction, history and development, types<br>3. • Bifocal lenses, Trifocal & Progressive addition lenses<br>4. • Reflections in bifocals at the dividing line<br>5. • Marking and measurement in dispensing optics. | 08 | CO4 |
| **Unit 5** | 5. Antireflection coating, Mirror coating, Hard Multi Coating [HMC],<br>6. • Spectacle magnifiers<br>7. • Lenticular & Aspherical lenses<br>8. • Special types of spectacle<br>9. • Industrial safety glasses<br>10. • Frame availability in Indian market<br>**11.** • Soft skills and professional communication with Patient and Customers | 06 | CO5 |

**CO-PO and PSO Mapping**

| CO | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO 6 | PO 7 | PO 8 | PSO 1 | PSO 2 | PSO 3 | PSO 4 | PSO 5 | PSO6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | 3 | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | 2 | - | - |
| **CO2** | 2 | 3 | 2 | 2 | - | - | - | 1 | 2 | 2 | 1 | 1 | - | - |
| **CO3** | 1 | 3 | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | 2 | - | - |
| **CO4** | 2 | 3 | 1 | 2 | - | - | - | 1 | 2 | 2 | 3 | 3 | - | - |
| **CO5** | 1 | 3 | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | 2 | - | - |

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

***Suggested Readings:***

**Text- Books**


4. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth –Heinemann, 2008
5. 2. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth –
6. Heinemann, 1996
7. 3. C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rdedition, Butterworth -
8. Heinemann, 2007
9. 4. Michael P Keating: Geometric, Phisical& Visual Optics, 2nd edition,

| | |
|---|---|
| | Butterworth –Heinemann, 2002 |
| **Reference Books** | 1. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth – Heinemann, 2008<br>2. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth –Heinemann, 1996 |
| **Para Text** | 1. C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rdedition, Butterworth -Heinemann, 2007<br>2. Michael P Keating: Geometric, Phisical& Visual Optics, 2nd edition, Butterworth –Heinemann, 2002 |

**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.**<br>**Section B:** Contains **02** Short questions out of which **03** questions are to be attempted. Each question carries **02 Marks**.<br>**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**<br>**Assistant Professor**<br><br>**Signature :** | **Course Approved by:- Mr. Sunil Kumar Gupta**<br>**Asst. Prof. & Incharge**<br><br>**Signature :** |

# FOURTH SEMESTER

## COURSE/ PAPER- VISUAL OPTICS II

**SUBJECT CODE- BOT-402**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**Learning objective**- To enable the students to understand the fundamentals of optical components of the eye.

**Learning Objective**- At the end of the course, the students will have theoretical knowledge and practical; skills on visual acuity measurement, objective and subjective refraction.

## UNIT- 1

- Accommodation & Presbyopia
- Far and near point of accommodation
- Range and amplitude of accommodation
- Anomalies of accommodation
- Presbyopia

## UNIT- 2

- Convergence
- Type, Measurement and Anomalies
- Relationship between accommodation & convergence (AC/A ratio)

## UNIT- 3

- Objective refraction ( Static & Dynamic)
- Streak retinoscopy
- Principle, Procedure, Difficulties and interpretation of findings
- Transposition and spherical equivalent
- Dynamic retinoscopy various methods

- Radical radioscopy and near radioscopy
- Cycloplegic refraction.

## UNIT- 4

- Subjective Refraction
- Principle and fogging
- Fixed astigmatic dial(Clock dial),Combination of fixed and rotator block test),J.C.C dial(Fan )
- Duochrome test
- Binocular balancing- alternate occlusion, prism dissociation, dissociate
- Duochrome balance, Borish dissociated fogging

## UNIT -5

- Effective Power & Magnification
- Ocular refraction vs. Spectacle refraction
- Spectacle magnification vs. Relative spectacle magnification
- Axial vs. Refractive Ametropia, Knapp's law
- Ocular accommodation vs. Spectacle accommodation
- Retinal image blur-Depth of focus and depth of field

**TEXT BOOK/REFERENCE BOOKS:**


1. Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinemann, 2007
2. Duke –Elder's practice of Refraction
3. AI Lens: Optics, Retinoscopy, and Refractometry: 2nd edition, SLACK Incorporated (p) Ltd, 2006
4. George K. Hans, Kenneth Cuiffreda: Models of the visual system, Kluwer Academic, NY, 2002

5. Leonard Werner, Leonard J. Press: Clinical Pearls in Refractive Care, Butterworth – Heinemann, 2002

6. David B. Elliot: Clinical Procedures in Primary Eye care, 3rd edition, Butterworth – Heinemann, 2007

7. WJ Benjamin: Borish's clinical refraction,2nd edition, Butterworth Heinemann, Missouri, USA, 2006

Department of Optometry

Era University, Lucknow

**Course Outline**

**Effective From: 2023-24**

| | | | | | |
|---|---|---|---|---|---|
| **Name of theProgram** | **Bachelor of Optometry** | | | **Year/ Semester:** | **2nd/4th** |
| **CourseName** | Visual Optics-II | **Course Code:** | **BOT402** | **Type:** | Regular |
| **Credits** | **03** | | | **Total Sessions Hours:** | **45** |
| **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 accommodation, convergence & its anomalies and their management options.<br>Also provide the knowledge of refraction, magnification, depth of field and their importance in the eye. | | | | |

**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 accommodation and convergence anomalies and their management options. |
| **CO1** | Understanding the concept of accommodation and their anomalies with management options. |
| **CO2** | Understanding the concept of Convergence and their relation with accommodation. |
| **CO3** | Applying concept of dynamic and static retinoscopy. |
| **CO4** | Understanding the basic concept of subjective refractions and their importance. |
| **CO5** | Understanding the basic concept of effective power and magnification in the eye. |
| **Internal EvaluationMode** | Class test+ weekly assignment<br>Attendence<br>Tutorial<br>Role play<br>Active learning |

| **Unit NO.** | **Title of the unit** | **Topic of unit** | **Hours** | **Mapped CO** |
|---|---|---|---|---|
| **Unit 1** | **BASIC CONCEPTS OF ACCOMMODATION IN THE EYE** | 2. Introduction of accommodation<br>3. Far and near point of accommodation<br>4. Range and amplitude of accommodation<br>5. Anomalies of accommodation<br>6. Presbyopia | 9 | CO1 |
| **Unit 2** | **BASIC CONCEPTS OF** | 1. Introduction of convergence<br>2. Type, measurement and anomalies of accommodation | 9 | CO2 |

| | | | | |
|---|---|---|---|---|
| | **CONVERGENCE** | 3. AC/A ratio | | |
| **Unit 3** | **RETINOSCOPY** | 15. Static and dynamic retinoscopy<br>16. Streak retinoscopy<br>17. Principle, Procedure, Difficulties and interpretation of findings<br>18. Transposition and spherical equivalent<br>19. Radical and near retinoscopy<br>20. Cycloplegic refraction | 9 | CO3 |
| **Unit 4** | **BASIC ASPECTS OF SUBJECTIVE REFRACTION** | 17. Introduction of subjective refraction<br>18. Fogging and duochrome test<br>19. Clock dial and JCC<br>20. Binocular balancing<br>21. Borish dissociated fogging | 9 | CO4 |
| **Unit 5** | **EFFECTIVE POWER & MAGNIFICATION** | 16. Effective power and magnification<br>17. Spectacle magnification (SM) vs. Relative spectacle magnification (RSM)<br>18. Retinal image blur<br>19. Knapp's law<br>20. Depth of focus and depth of field | 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 | 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. Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth-Heinemann 2007.
2. Duke-Elder's: Practice of Refraction
3. AI Lens: Optics, Retinoscopy and Refractometry: 2nd edition, SLACK Incorporated (p) Ltd.

**Reference Books**

11. George K. Hans, Kenneth Cuiffreda: Models of the visual system, Kluwer Academic, NY, 2002
12. Leonard Werner, Leonard J. Press: Clinical Pearls in Refractive Care, Butterworth-Heinemann, 2002.
13. David B. Elliot: Clinical Procedures in Primary Eye Care, 3rd edition, Butterworth-Heinemann, 2007.
14. WJ Benjamin: Borish's clinical refraction, 2nd edition, Butterworth-Heinemann, Missouri, USA, 2006.

**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<br>75-85 2 MARKS |

| | | |
|---|---|---|
| | | 85-95 3 MARKS<br>>95 % 4 MARKS |
| **Total Marks** | **30** | |

| | |
|---|---|
| **Course created by: SALAL MOHAMMAD (AP)**<br>**Signature:** | **Approved by:**<br>**Signature:** |

# FOURTH SEMESTER

## COURSE/ PAPER - OCULAR DISEASE- II

**SUBJECT CODE- BOT-403**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**Learning Objective-**To enable the students to gain knowledge about the etiology, clinical features, investigation and complications of posterior segment ocular disorders.

**Learning Outcome-**At the end of the course, the students will be able to approach correct diagnosis and management of the anterior segment ocular disorder.

**UNIT- 1**

- Vitreous-Applied Anatomy & physiology
- Vitreous opacities, degeneration and inflammation
- Vitreous haemorrhage
- Vitreous detachment
- Surgical management of vitreous disorder.

**UNIT -2**

- Choroid and Retina-Applied Anatomy & physiology
- Disorder of choroid.
- Congenital disorder of retina
- Inflammatory disorder of retina
- Vascular disorder of retina
- Retinopathies
- Retinal detachment
- Tumours of the retina

- Surgical management of the retinal disorders.

**UNIT -3**

- Ocular Injuries
- Closed Globe Injuries
- Open Globe Injuries
- Mechanical Injuries
- Non Mechnical Injuries
- Clinical approach towards ocular injury patients

**UNIT- 4**

- Clinical Neuro-ophthalmology
- Anatomy of visual pathway
- Lesions of the visual pathway
- Pupilary Reflex & Abnormalities
- Optic neuritis, ischaemic and non-ischemic optic neuropathy, Pappilloedema, optic atrophy , Cortical blindness Malingering Nystagmus

**UNIT- 5**

- Glaucoma
- Applied anatomy and physiology of anterior segment
- Clinical Examination
- Definitions and classification of glaucoma
- Pathogenesis of glaucomatous ocular damage
- Congenital glaucoma's
- Primary open angle glaucoma

- Ocular hypertension
- Normal Tension Glaucoma
- Primary angle closure Glaucoma(suspect, intermittent glaucoma, acute congestive and chronic angle closure)
- Secondary glaucoma
- Management-Common medications, laser intervention and surgical techniques.

**TEXT BOOK:** A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international

(p) Ltd. Publishers, New Delhi, 2007

**REFERENCE BOOKS:**


1. Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
2. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth-

   Heinemann, 2007

Department of Optometry

Era University, Lucknow

**Course Outline**

**Effective From: 2023-24**

| | | | | | |
|---|---|---|---|---|---|
| **Name of theProgram** | **Bachelor of Optometry** | | | **Year/ Semester:** | **1st/2nd** |
| **CourseName** | Ocular Disease-II | **Course Code:** | **BOT403** | **Type:** | Regular |
| **Credits** | **03** | | | **Total Sessions Hours:** | **45** |
| **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 enable the students to gain knowledge about the etiology, clinical features, investigation and complications of posterior segment ocular disorders. | | | | |

**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 approach correct diagnosis of the Posterior segment ocular disorder. |
| **CO1** | Understanding of the disease and diagnosis of vitreous disorders |
| **CO2** | Understanding ofthe disease and diagnosis of choroid and retina disorders. |
| **CO3** | To understand the different types of ocular injuries and their management. |
| **CO4** | Understanding of the clinical neuro-ophthalmology |
| **CO5** | Understanding of the disease and diagnosis Glaucoma |
| **Internal EvaluationMode** | Class test+ weekly assignment<br>Attendence<br>Tutorial<br>Role play<br>Active learning |

| **Unit NO.** | **Title of the unit** | **Topic of unit** | **Hours** | **Mapped CO** |
|---|---|---|---|---|
| **Unit 1** | **VITREOUS-APPLIED ANATOMY, PHYSIOLOGY AND DISORDERS** | 1.Vitreous-Applied Anatomy & physiology<br>2. Vitreous opacities, degeneration and inflammation<br>3. Vitreous haemorrhage<br>4. Vitreous detachment | 9 | CO1 |

| | | | | |
|---|---|---|---|---|
| | | 5. Surgical management of vitreous disorder. | | |
| **Unit 2** | **CHOROID AND RETINA-APPLIED ANATOMY, PHYSIOLOGY AND DISORDERS** | 21. Choroid and Retina-Applied Anatomy & physiology<br>22. Disorder of choroid.<br>23. Congenital disorder of retina<br>24. Inflammatory disorder of retina<br>25. Vascular disorder of retina<br>26. Retinopathies<br>27. Retinal detachment<br>28. Tumours of the retina<br>29. Surgical management of the retinal disorders | 9 | CO2 |
| **Unit 3** | **OCULAR INJURIES** | 1. Ocular Injuries<br>2. Closed Globe Injuries<br>3. Open Globe Injuries<br>4. Mechanical Injuries<br>5. Non Mechnical Injuries<br>6. Clinical approach towards ocular injury patients | 9 | CO3 |
| **Unit 4** | **CLINICAL NEURO-OPHTHALMOLOGY** | 1. Clinical Neuro-ophthalmology<br>2. Anatomy of visual pathway<br>3. Lesions of the visual pathway<br>4. Pupilary Reflex & Abnormalities<br>5. Optic neuritis<br>6. Ischaemic and non-ischemic optic neuropathy<br>7. Pappilloedema<br>8. Optic atrophy<br>9. Cortical blindness Malingering Nystagmus | 9 | CO4 |

| | | | | |
|---|---|---|---|---|
| **Unit 5** | **GLAUCOMA** | 1. Glaucoma<br>2. Applied anatomy and physiology of anterior segment<br>3. Clinical Examination<br>4. Definitions and classification of glaucoma<br>5. Pathogenesis of glaucomatous ocular damage<br>6. Congenital glaucoma's<br>7. Primary open angle glaucoma<br>8. Ocular Hypertension<br>9. Normotensive glaucoma<br>11. Primary angle closure glaucoma<br>12. Secondary glaucoma<br>13. Management-common medications, laser inyterventions and surgical techniques. | 9 | CO5 |

**CO-PO and PSO Mapping**

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

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

**Suggested Readings:**

| | |
|---|---|
| **Text- Books** | A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007 |
| **Reference Books** | 1. Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990<br>2. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6thedition, Butterworth-Heinemann, 2007<br>15. |

**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<br>75-85 2 MARKS<br>85-95 3 MARKS<br>>95 % 4 MARKS |
| **Total Marks** | **30** | |

| | |
|---|---|
| **Course created by: Ramlah Akhtar (Tutor)**<br>**Signature:** | **Approved by:**<br>**Signature:** |

# FOURTH SEMESTER

## COURSE/ PAPER- PATHOLOGY

**SUBJECT CODE- BOT-404**

| L | T | P | C |
|---|---|---|---|
| 2 | - | - | 2 |

**Learning objective-** To teach the students basic aspects of disease processes with reference to specific entities relevant in optometry/ophthalmology.

**Learning Outcome-** At the end of the course students will have the knowledge in Inflammation and repair aspects as well as the Pathology of various eye parts and adnexa.

## UNIT- 1

- Inflammation and repair
- Infection in general

## UNIT - 2

- Specific infections
- Tuberculosis
- Leprosy
- Syphilis
- Fungal infection
- Viral chlamydial infection

## UNIT -3

- Neoplasia
- Haematology
- Anemia
- Leukemia

- Bleeding disorders

## UNIT - 4

- Circulatory disturbances
- Thrombosis
- Infarction
- Embolism
- Clinical pathology
- Interpretation of urine report
- Interpretation of blood smears.

## UNIT -5

- Immune system
- Shock, Anaphylaxis.
- Allergy

**TEXT BOOK**

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

**REFERENCE BOOKS:**

1. Corton kumar and robins: Pathological Basis of the Disease, 7th Edition, Elsevier, New Delhi, 2004.

2. S R Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993.

Department of Optometry

Era University, Lucknow

**Course Outline**

**Effective From: 2023-24**

| | | | | | |
|---|---|---|---|---|---|
| **Name of theProgram** | **Bachelor of Optometry** | | | **Year/ Semester:** | **2nd/4th** |
| **CourseName** | Pathology | **Course Code:** | **BOT404** | **Type:** | Regular |
| **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 this course is to teach the students basic aspects of disease processes with reference to specific entities relevant in optometry/ophthalmology. | | | | |

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

| | |
|---|---|
| **Course Outcome (CO)** | At the end of the course students will have the knowledge in Inflammation and repair aspects as well as the Pathology of various eye parts and adnexa. |
| **CO1** | Understanding the basic about inflammation and repair |
| **CO2** | Understanding the concept of specific infections |
| **CO3** | Understanding about neoplasia and bleeding disorders |
| **CO4** | Understanding about circulatory disturbance and analyse the interpretation of urine report |
| **CO5** | Understanding about immune system and allergy |
| **Internal EvaluationMode** | Class test+ weekly assignment<br>Attendance<br>Tutorial<br>Role play<br>Active learning |

| **Unit NO.** | **Title of the unit** | **Topic of unit** | **Hours** | **Mapped CO** |
|---|---|---|---|---|
| **Unit 1** | **INFLAMMATION & REPAIR** | 7. Introduction of pathology<br>8. Inflammation<br>9. Repair<br>10. Infection in general | 6 | CO1 |

| | | | | |
|---|---|---|---|---|
| **Unit 2** | **SPECIFIC INFECTIONS** | 1. Tuberculosis & Leprosy<br>2. Syphilis<br>3. Fungal infections<br>3. Viral and chalamydial infections | 6 | CO2 |
| **Unit 3** | **BASIC HAEMATOLOGY** | 30. Neoplasia<br>31. Anemia<br>32. Leukemia<br>33. Bleeding disorders | 6 | CO3 |
| **Unit 4** | **CIRCULATORY DISTURBANCES** | 22. Thrombosis & Infarction<br>23. Embolism<br>24. Interpretation of urine and blood smears report | 6 | CO4 |
| **Unit 5** | **IMMUNE SYSTEM** | 21. Shock, Anaphylaxis<br>22. Allergy, Hypersensitivity | 6 | CO5 |

**CO-PO and PSO Mapping**

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

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

**Suggested Readings:**

| | |
|---|---|
| **Text- Books** | **1.** K S Ratnagar: Pathology of the eye & orbit, Jaypee brothers Medical Publishers, 1997 |
| **Reference Books** | 1. Corton kumar and robins: Pathological Basis of the Disease, 7th Edition, Elsevier, New Delhi, 2004.<br>2. S R Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993. |

**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<br>75-85 2 MARKS<br>85-95 3 MARKS<br>>95 % 4 MARKS |
| **Total Marks** | **30** | |

**Course created by: SALAL MOHAMMAD (AP)**

**Signature:**

**Approved by:**

**Signature:**

# FOURTH SEMESTER

**COURSE/ PAPER - BASIC AND OCULAR PHARMACOLOGY**

**SUBJECT CODE- BOT-405**

| L | T | P | C |
|---|---|---|---|
| 3 | - | - | 3 |

**Learning objective-**The objective of the course is to covers the actions, uses, adverse effects and mode of administration of drugs, especially related to eyes.

**Learning Outcome-**At the end of the course, the students have thorough knowledge of the basic principle of pharmacokinetics & Pharmacodynamics as well as the Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects

## UNIT -1

**General Pharmacology:** Introduction & sources of drugs, Routes of drug administration, Pharmacokinetics (emphasis on ocular pharmacokinetics), Pharmacodynamics & factor modifying drug

## UNIT- 2

**Systemic pharmacology-** ANS, drugs affecting pupillary size and light reflex,intraocular tension, Accommodation.

**General & local anesthetics, Chemotherapy:** Introduction on general chemotherapy, specific chemotherapy Antiviral, antifungal, antibiotics;steroids, Anti-diabetics; Blood Coagulants

## UNIT 3

**Ocular Pharmacology:** Ocular preparations, Ocular pharmacokinetics, methods of drug administration and special drug delivery system, Ocular toxicology.

## UNIT 4

**Diagnostic & Therapeutic applications of drugs used in Ophthalmology:** Diagnostic Drugs & biological agents used in ocular surgery, Anaesthetics used in ophthalmic procedure Anti-glaucoma drugs; Pharmacotherapy of ocular infections –Bacterial, viral, fungal.

## UNIT 5

Drugs used in allergic, inflammatory& degenerative conditions of the eye; Immune modulators in ophthalmic practice, Wetting agents & tear substitutes and anti-oxidants.

**TEXT BOOK**


1. K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004
2. Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996
3. T J Zimmerman, K S Kooner : Text Book of Ocular Pharmacology, Lippincott-Raven, 1997


**REFERENCE BOOKS:**


3. CORTON KUMAR AND ROBINS: Pathological Basis of the Disease, 7th Edition, Elsevier, New Delhi, 2004.
4. S R Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993.

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

| | | | | | |
|---|---|---|---|---|---|
| **Name of the Program** | **Bachelor of optometry** | | | **Year/Semester:** | **4th** |
| **Course Name** | **Basic & Ocular Pharmacology** | **Course Code:** | **BOT405** | **Type: Semester** | |
| **Credits** | **3** | | | **Total Sessions Hours:** | **45** |
| **Evaluation Spread** | **Internal Continuous Assessment:** | | | **End Term Exam:** | |
| **Type of Course** | ○ Compulsory | ◉ Core | | ○ Creative | ○ Life Skill |
| **Course Objectives** | At the end of the course the students will acquire knowledge in the following aspects:<br>• Basic principle of pharmacokinetics & Pharmacodynamics.<br>Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects | | | | |

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

| **Course Outcome( CO)** | |
|---|---|
| **CO1** | Understanding the basics of drugs and its different sources as well as pharmaco-dynamics and pharmaco-kinetics. |
| **CO2** | Understanding the concept & terminologies of Pharmacology and Ocular preparations. |
| **CO3** | Understanding the advantages and disadvantages of general routes of drug administration and routes of drug administration in Ophthalmology. |
| **CO4** | Applying of different pharmaceutical agents in the management of Ocular disease as well as managing Ocular Toxicity. |
| **CO5** | Analyzing and applying diagnostic and therapeutic drugs in Ophthalmology. |
| **Pedagogy** | Collaborative<br>Reflected on pattern<br>Differentiated Learning<br>Constructivist learning |
| **Internal Evaluation Mode** | Class test+ weekly assignment<br>Attendance<br>Tutorial<br>Role play<br>Active learning |

| Unit NO. | Title of the unit | Topic of unit | Hours | Mapped CO |
|---|---|---|---|---|
| **Unit1** | **General Pharmacology:** | Introduction & sources of drugs, Routes of drug administration, Pharmacokinetics (emphasis on ocular pharmacokinetics), Pharmacodynamics & factor modifying drug | 6 | CO1 |
| **Unit2** | **Systemic pharmacology** | - ANS, drugs affecting pupillary size and light reflex,intraocular tension, Accommodation. **General & local anesthetics, Chemotherapy:** Introduction on general chemotherapy, specific chemotherapy Antiviral, antifungal, antibiotics;steroids, Anti-diabetics; Blood Coagulants 2. | 6 | CO2 |
| **Unit3** | **Ocular Pharmacology:** | Ocular preparations, Ocular pharmacokinetics, methods of drug administration and special drug delivery system, Ocular toxicology. | 6 | CO3 |
| **Unit4** | **Diagnostic & Therapeutic applications of drugs used in Ophthalmology:** | Diagnostic Drugs & biological agents used in ocular surgery, Anaesthetics used in ophthalmic procedure Anti-glaucoma drugs; Pharmacotherapy of ocular infections – Bacterial, viral, fungal. | 6 | CO4 |
| **Unit 5** | | Drugs used in allergic, inflammatory& degenerative conditions of the eye; Immune modulators in ophthalmic practice, Wetting agents & tear substitutes and anti-oxidants. | 6 | CO5 |

**CO-PO and PSO Mapping**

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

*Strongcontribution-3, Averagecontribution-2, Lowcontribution-1,*

**Suggested Readings:**

| | |
|---|---|
| **Text-Books** | **2.** A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007 |
| **Reference Books** | 3. 1. K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004<br>4. 2. Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996<br>5. 3. T J Zimmerman, K S Kooner:Text Book of Ocular Pharmacology, Lippincott-Raven, 1997 |
| **Para Text** | **Unit1:**<br>**Unit2:**<br>**Unit3:**<br>**Unit4:**<br>**Unit 5:** |

**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<br>75-85 2 MARKS<br>85-95 3 MARKS<br>MORE THAN 95 % 4 MARKS |
| **Total Marks** | **30** | |

**Course created by: Jamshed Ali**

**Signature:**

**Approved by:**

**Signature:**

# FOURTH SEMESTER

**COURSE/ PAPER - INTRODUCTION TO QUALITY AND PATIENT SAFETY**

**SUBJECT CODE- BOT-406**

| L | T | P | C |
|---|---|---|---|
| 2 | - | - | 2 |

**Learning Objective-** To enable the students to have knowledge on various aspects of quality and safety issues in health care services.

**Learning Outcome-** At the end of the course, students have gained introductory knowledge about quality and patient safety aspects from Indian perspectives

## UNIT- 1

- Quality assurance: Process-Oriented, Preventative Approach, Standards and Procedures, Testing and Inspection, Continuous Improvement, Training and Education, Documentation
- Quality Management: Holistic Approach, Customer Focus, Leadership Involvement, Continuous Improvement, Risk Management, Supplier Management, Compliance and Regulations, Feedback Loop

## UNIT- 2

- Basics of emergency care and life support skills: Assess the Scene, Check Responsiveness, Call for Help, ABCs of Assessment, Perform CPR (Cardiopulmonary Resuscitation), Use an AED (Automated External Defibrillator), Manage Bleeding, Treat for Shock, Monitor Vital Signs, Provide Emotional Support

## UNIT- 3

- Biomedical waste management and environment safety: Types of Biomedical Waste, Importance of Proper Management, Best Practices for Biomedical Waste Management, Environmental Safety Measures

## UNIT- 4

- Infection and prevention control: Hand Hygiene, Personal Protective Equipment (PPE), Environmental Cleaning and Disinfection, Standard Precautions, Transmission-Based Precautions, Respiratory Hygiene and Cough Etiquette, Safe Injection Practices, Surveillance and Outbreak Management, Education and Training, Collaboration and Communication

## UNIT- 5

- Antibiotic resistance: Causes of Antibiotic Resistance, Impact of Antibiotic Resistance, Strategies to Address Antibiotic Resistance,

- Disaster preparedness and management: Risk Assessment, Emergency Planning, Public Awareness and Education, Resource Allocation, Early Warning Systems, Collaboration and Coordination, Training and Drills, Infrastructure Resilience, Emergency Communication, Post-Disaster Recovery
- **TEXT BOOKS**: Faculty to recommended
- **REFERENCE BOOKS:** Faculty to recommend

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

| | | | | | |
|---|---|---|---|---|---|
| **Name of the Program** | **Bachelor of Optometry** | | | **Year/ Semester:** | **2st/4th** |
| **Course Name** | Introduction to patients' quality and safety | **CourseCode:** | **BOT406** | **Type:** | Regular |
| **Credits** | **02** | | | **Total Sessions Hours:** | **30** |
| **Evaluation Spread** | **Internal Continuous Assessment:** | **30** | | **End Term Exam:** | **70** |
| **Type of Course** | ○ Compulsory | ◉ Core | | ○ Creative | ○ Life Skill |
| **Course Objectives** | The objective of the course is to make the students aware about the traditional and latest healthcare system. | | | | |
| **Course Outcomes (CO):** *After the successful course completion, learners will develop following attributes:* | | | | | |
| **Course Outcome (CO)** | The objective of patient quality and safety is to ensure that patients receive the highest standard of care possible while minimizing the risk of harm or errors in healthcare settings. | | | | |
| **CO1** | **Optimal Outcomes**: Ensuring that patients achieve the best possible health outcomes from their healthcare encounters, including effective treatments, minimal complications, and satisfactory experiences. | | | | |
| **CO2** | **Patient-Centered Care**: Focusing on the individual needs, preferences, and values of each patient, promoting their active involvement in decision-making, and respecting their autonomy and dignity throughout the care process. | | | | |
| **CO3** | **Safety**: Preventing medical errors, adverse events, infections, and other avoidable harms to patients by implementing robust safety protocols, quality improvement initiatives, and evidence-based practices. | | | | |
| **CO4** | 1. **Effective Communication**: Facilitating clear and open communication among healthcare providers, patients, and their families to promote understanding, shared decision-making, and continuity of care.<br>2. **Transparency and Accountability**: Promoting transparency in healthcare delivery by openly sharing information about performance, outcomes, and safety measures, and holding healthcare providers and organizations accountable for the quality and safety of care they provide. | | | | |
| **CO5** | 1. **Continuous Improvement**: Engaging in ongoing monitoring, evaluation, and enhancement of healthcare practices, systems, and policies to identify areas for improvement and ensure consistent delivery of high-quality, safe care.<br>2. **Evidence-Based Practice**: Integrating the best available evidence from scientific research, clinical expertise, and patient preferences into healthcare decision-making to optimize outcomes and minimize risks. | | | | |
| **Internal Evaluation Mode** | Class test+ weekly assignment<br>Attendence<br>Tutorial<br>Role play<br>Active learning | | | | |
| | | | | | |
| **Unit NO.** | **Title of the unit** | **Topic of unit** | | **Hours** | **Mapped CO** |
| **Unit 1** | **QUALITY ASSURANCE** | **Quality Assurance (QA):**<br>1. **Process-Oriented**: QA focuses on ensuring that the processes | | | CO1 |

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| | **AND MANAGEMENT** | used to create and deliver products or services meet the desired standards.<br>2. **Preventative Approach**: QA activities are proactive, aiming to prevent defects rather than identifying and fixing them after they occur.<br>3. **Standards and Procedures**: QA involves establishing standards, procedures, and guidelines to be followed throughout the product development or service delivery lifecycle.<br>4. **Testing and Inspection**: QA involves various testing and inspection activities to verify that products or services meet specified requirements.<br>5. **Continuous Improvement**: QA emphasizes continuous improvement by analyzing data and feedback to identify areas for enhancement in processes or products.<br>6. **Training and Education**: QA often involves providing training and education to team members to ensure they understand and adhere to quality standards.<br>7. **Documentation**: QA requires thorough documentation of processes, test plans, test results, and other relevant information to ensure traceability and accountability.<br>**Quality Management:**<br>1. **Holistic Approach**: Quality management encompasses all aspects of an organization, including processes, people, and resources, to ensure overall quality.<br>2. **Customer Focus**: Quality management places a strong emphasis on understanding and meeting customer requirements and expectations.<br>3. **Leadership Involvement**: Effective quality management requires active involvement and commitment from organizational leadership to establish a culture of quality.<br>4. **Continuous Improvement**: Like QA, quality management prioritizes continuous improvement through data analysis, feedback mechanisms, and regular reviews.<br>5. **Risk Management**: Quality management involves identifying and mitigating risks that could impact the quality of products or services.<br>6. **Supplier Management**: Quality management extends beyond internal processes to include managing relationships with suppliers and ensuring their products or services meet quality standards.<br>7. **Compliance and Regulations**: Quality management ensures compliance with relevant regulations, standards, and industry best practices.<br>8. **Feedback Loop**: Quality management establishes mechanisms for gathering feedback from customers, employees, and other stakeholders to drive improvements.<br>Both QA and quality management are essential components of achieving and maintaining high levels of quality in products or services, and they often work hand in hand to achieve organizational goals and objectives.<br>11. | 9 | |
| **Unit 2** | **BASICS OF EMERGENCY CARE AND LIFE SUPPORT SKILLS** | **1. Assess the Scene:**<br>• Before approaching, ensure the scene is safe for both the rescuer and the victim.<br>• Look for potential hazards such as fire, traffic, or dangerous substances.<br>**2. Check Responsiveness:**<br>• Gently tap the victim and ask loudly, "Are you okay?"<br>• Look for any response, such as movement or verbal | 9 | CO2 |

communication.

**3. Call for Help:**

- If the victim is unresponsive, immediately call emergency services (e.g., 911) or ask someone else to do so.
- Provide clear and concise information about the situation and location.

**4. ABCs of Assessment:**

- Assess the victim's Airway, Breathing, and Circulation (ABCs) in that order.
- Ensure the airway is clear and unobstructed.
- Check for breathing by looking, listening, and feeling for breaths.
- Assess circulation by checking for a pulse and signs of severe bleeding.

**5. Perform CPR (Cardiopulmonary Resuscitation):**

- If the victim is unresponsive and not breathing normally, start CPR immediately.
- Begin with chest compressions to maintain blood circulation.
- Combine chest compressions with rescue breaths in a ratio of 30 compressions to 2 breaths.

**6. Use an AED (Automated External Defibrillator):**

- If an AED is available, follow the device's prompts to deliver a shock if advised.
- Ensure that no one is touching the victim during defibrillation.

**7. Manage Bleeding:**

- Apply direct pressure to control severe bleeding.
- Use a sterile bandage or cloth if available.
- Elevate the injured limb if possible.

**8. Treat for Shock:**

- Keep the victim lying down and elevate their legs slightly to improve blood flow to vital organs.
- Cover the victim with a blanket to maintain body temperature.

**9. Monitor Vital Signs:**

- Continuously monitor the victim's airway, breathing, pulse, and level of consciousness.
- Be prepared to provide additional care or interventions

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| | | as needed until emergency medical services arrive.<br>**10. Provide Emotional Support:**<br>• Stay calm and reassure the victim to help reduce anxiety and stress.<br>• Offer comfort and support while waiting for professional medical assistance.<br>Remember, these are basic guidelines, and proper training and certification in CPR, first aid, and other emergency care skills are essential for effectively responding to medical emergencies. Additionally, always follow local protocols and guidelines when providing emergency care. | | |
| **Unit 3** | **BIOMEDICAL WASTE AND ENVIRONMENTAL SAFETY** | **Types of Biomedical Waste:**<br>1. **Infectious Waste**: Waste contaminated with blood, bodily fluids, or other potentially infectious materials.<br>2. **Pathological Waste**: Human or animal tissues, organs, or body parts.<br>3. **Sharps Waste**: Needles, syringes, lancets, and other sharp objects.<br>4. **Pharmaceutical Waste**: Expired, unused, or contaminated medications.<br>5. **Chemical Waste**: Chemicals used in healthcare procedures, such as disinfectants and laboratory reagents.<br>6. **Radioactive Waste**: Materials contaminated with radioactive substances, like radioactive isotopes used in medical imaging or treatment.<br>**Importance of Proper Management:**<br>1. **Preventing Disease Transmission**: Improper handling and disposal of biomedical waste can lead to the transmission of infectious diseases to healthcare workers, waste handlers, and the general public.<br>2. **Environmental Protection**: Biomedical waste can contain hazardous chemicals, pathogens, and other pollutants that, if not managed properly, can contaminate soil, water, and air, posing risks to ecosystems and public health.<br>3. **Legal Compliance**: Many countries have regulations and guidelines for the safe management and disposal of biomedical waste to protect public health and the environment. Compliance with these regulations is essential to avoid legal consequences.<br>4. **Community Safety**: Proper disposal of biomedical waste prevents scavenging by animals or informal waste pickers, reducing the risk of accidental exposure to hazardous materials.<br>**Best Practices for Biomedical Waste Management:**<br>1. **Segregation**: Separate different types of biomedical waste at the point of generation to facilitate proper handling, treatment, and disposal.<br>2. **Containment**: Store biomedical waste in leak-proof, puncture-resistant containers labeled with appropriate warning signs.<br>3. **Treatment**: Treat biomedical waste through methods such as autoclaving, incineration, chemical disinfection, or microwave treatment to inactivate pathogens and reduce the volume of waste.<br>4. **Transportation**: Transport biomedical waste using dedicated vehicles equipped with proper containment and safety measures to prevent spills or leaks during transit. | 9 | CO3 |

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| | | 5. **Disposal**: Dispose of treated biomedical waste according to local regulations, which may include landfilling, incineration, or other approved methods.<br>6. **Training and Education**: Provide training to healthcare workers and waste handlers on proper waste management practices, including segregation, handling, and disposal procedures.<br>**Environmental Safety Measures:**<br>1. **Waste Minimization**: Implement strategies to reduce the generation of biomedical waste, such as using reusable medical devices, optimizing inventory management, and promoting the rational use of medications.<br>2. **Pollution Control**: Install pollution control equipment in healthcare facilities, such as scrubbers and filters, to minimize emissions during waste treatment processes.<br>3. **Monitoring and Reporting**: Regularly monitor waste management practices, environmental impacts, and compliance with regulations. Report any deviations or incidents promptly to appropriate authorities.<br>Effective management of biomedical waste requires collaboration among healthcare facilities, waste management authorities, regulatory agencies, and the community to safeguard public health and environmental well-being. | | |
| **Unit 4** | **INFECTION AND PREVENTION CONTROL** | Infection prevention and control (IPC) is a vital component of healthcare practices aimed at minimizing the risk of healthcare-associated infections (HAIs) and the spread of infectious diseases. Here are key aspects of IPC:<br>**1. Hand Hygiene:**<br>• Regular handwashing with soap and water or using alcohol-based hand sanitizers is the single most effective measure to prevent the spread of infections.<br>• Healthcare workers should adhere to proper hand hygiene protocols, including before and after patient contact, after touching contaminated surfaces, and before performing invasive procedures.<br>**2. Personal Protective Equipment (PPE):**<br>• Healthcare workers should use appropriate PPE, such as gloves, gowns, masks, and eye protection, to protect themselves and patients from exposure to infectious agents.<br>• Proper donning and doffing techniques are essential to prevent contamination during PPE use.<br>**3. Environmental Cleaning and Disinfection:**<br>• Regular cleaning and disinfection of patient care areas, medical equipment, and frequently touched surfaces help prevent the transmission of pathogens.<br>• Use EPA-approved disinfectants and follow manufacturer instructions for effective disinfection.<br>**4. Standard Precautions:** | 9 | CO4 |

- Standard precautions are fundamental infection control principles applied to all patients, regardless of their suspected or confirmed infectious status.
- They include measures such as hand hygiene, PPE use, safe injection practices, and proper handling of contaminated equipment and surfaces.

**5. Transmission-Based Precautions:**

- Transmission-based precautions are additional measures used for patients with known or suspected infections, based on the route of transmission (contact, droplet, or airborne).
- Examples include isolation precautions, such as placing patients in single rooms or using specialized ventilation systems for airborne infections.

**6. Respiratory Hygiene and Cough Etiquette:**

- Encourage patients and visitors to practice respiratory hygiene by covering their mouth and nose with a tissue or elbow when coughing or sneezing.
- Provide tissues and hand sanitizers in waiting areas and healthcare facilities.

**7. Safe Injection Practices:**

- Use aseptic techniques when administering injections or performing invasive procedures to prevent needlestick injuries and transmission of bloodborne pathogens.
- Never reuse needles or syringes and properly dispose of sharps in puncture-resistant containers.

**8. Surveillance and Outbreak Management:**

- Conduct surveillance for HAIs to monitor trends, identify outbreaks, and implement appropriate control measures.
- Promptly investigate and respond to suspected outbreaks through infection control interventions, including cohorting patients and implementing enhanced cleaning protocols.

**9. Education and Training:**

- Provide ongoing education and training to healthcare workers on IPC practices, including hand hygiene, PPE use, and infection control protocols.
- Empower patients and families with information on infection prevention measures and their role in reducing the spread of infections.

**10. Collaboration and Communication:**

- Foster interdisciplinary collaboration among healthcare professionals, infection control teams, and support staff

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| | | to ensure consistent adherence to IPC guidelines.<br>• Establish effective communication channels for sharing information about infectious disease outbreaks, updates on IPC protocols, and best practices.<br>By implementing comprehensive IPC measures, healthcare facilities can effectively reduce the risk of HAIs, protect patients and healthcare workers, and promote a safe healthcare environment. | | |
| **Unit 5** | **1. ANTIBIOTIC RESISTANCE**<br>**2. DISASTER PREPAREDNESS AND MANAGEMENT** | Antibiotic resistance occurs when bacteria adapt and become resistant to the effects of antibiotics, rendering these medications less effective or ineffective in treating bacterial infections. Here's a closer look at antibiotic resistance:<br><br>**Causes of Antibiotic Resistance:**<br>1. **Overuse and Misuse of Antibiotics**: Inappropriate use of antibiotics, such as taking them for viral infections or not completing the full course of treatment, can contribute to the development of resistance.<br>2. **Poor Infection Control Practices**: Inadequate infection prevention and control measures in healthcare settings can facilitate the spread of resistant bacteria.<br>3. **Use in Agriculture and Livestock**: Antibiotics are often used in agriculture for growth promotion and disease prevention in livestock, contributing to the emergence of resistant bacteria that can spread to humans through food consumption or environmental contamination.<br>4. **Lack of New Antibiotics**: The development of new antibiotics has slowed down, leading to fewer treatment options for drug-resistant infections.<br>**Impact of Antibiotic Resistance:**<br>1. **Treatment Failure**: Antibiotic resistance can lead to treatment failure, prolonging illness and increasing the risk of complications and mortality.<br>2. **Increased Healthcare Costs**: Resistant infections require more expensive and prolonged treatment, leading to higher healthcare costs for individuals and healthcare systems.<br>3. **Compromised Patient Safety**: Patients with resistant infections are at greater risk of healthcare-associated infections and complications, including sepsis and organ failure.<br>4. **Global Health Threat**: Antibiotic resistance is recognized as a significant global health threat, compromising the ability to control infectious diseases and undermining progress in healthcare and medicine.<br>**Strategies to Address Antibiotic Resistance:**<br>1. **Stewardship Programs**: Implement antibiotic stewardship programs in healthcare settings to promote appropriate antibiotic use, optimize treatment, and prevent the emergence and spread of resistant bacteria.<br>2. **Infection Prevention and Control**: Enhance infection | 9 | CO5 |

prevention and control measures in healthcare facilities to reduce the transmission of resistant bacteria.

3. **Public Education**: Raise awareness among healthcare providers, patients, and the general public about the importance of prudent antibiotic use, infection prevention, and the consequences of antibiotic resistance.
4. **Research and Development**: Invest in research and development of new antibiotics, alternative treatment options, and diagnostic tools to combat antibiotic-resistant infections.
5. **Global Collaboration**: Foster international collaboration and coordination to address antibiotic resistance at a global level, including surveillance, research, and policy development.
6. **Regulatory Measures**: Implement regulatory measures to restrict the use of antibiotics in agriculture, promote responsible antibiotic use in healthcare, and incentivize the development of new antibiotics.

**Disaster preparedness and management involve proactive measures and strategies to mitigate the impact of disasters and effectively respond to emergencies. Here are key points:**

1. **Risk Assessment**: Identify potential hazards and vulnerabilities in the community, infrastructure, and environment to understand the scope of potential disasters.

2. **Emergency Planning**: Develop comprehensive emergency plans outlining roles, responsibilities, and procedures for disaster response and recovery efforts.

3. **Public Awareness and Education**: Educate the public about disaster risks, preparedness measures, evacuation routes, and emergency contacts to enhance community resilience.

4. **Resource Allocation**: Allocate resources, including personnel, equipment, and supplies, to support emergency response activities and ensure effective coordination.

5. **Early Warning Systems**: Implement early warning systems, such as sirens, alerts, and communication channels, to disseminate timely information and warnings to the public.

6. **Collaboration and Coordination**: Foster collaboration among government agencies, non-governmental organizations (NGOs), community groups, and stakeholders to streamline disaster response efforts.

7. **Training and Drills**: Conduct regular training exercises and drills to familiarize responders with emergency procedures, improve coordination, and test the effectiveness of response plans.

8. **Infrastructure Resilience**: Invest in resilient infrastructure and building codes to withstand natural disasters, such as earthquakes, hurricanes, floods, and wildfires.

9. **Emergency Communication**: Establish reliable communication networks and channels to facilitate

| | | | | |
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| | | information sharing, coordination, and decision-making during emergencies.<br><br>10. **Post-Disaster Recovery**: Implement post-disaster recovery and reconstruction efforts to restore essential services, infrastructure, and livelihoods, while prioritizing the safety and well-being of affected communities.<br><br>By prioritizing disaster preparedness and management, communities can reduce the loss of life, minimize property damage, and enhance their ability to recover and rebuild in the aftermath of disasters. | | |

**CO-PO and PSO Mapping**

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

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

**Suggested Readings:**

| | |
|---|---|
| **Text- Books** | |

**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<br>75-85 2 MARKS<br>85-95 3 MARKS<br>>95 % 4 MARKS |
| **Total Marks** | **30** | |

**Course created by: RAMLAH AKHTAR (Tutor)**

**Signature:**

**Approved by:**

**Signature:**

# FOURTH SEMESTER

## COURSE/ PAPER - MEDICAL PSYCHOLOGY

**SUBJECT CODE- BOT-407**

| L | T | P | C |
|---|---|---|---|
| 2 | - | - | 2 |

**Learning Objective-** The objective of this course is to cover various aspects of medical psychology essential for the optometrist.
**Learning Outcome-** At the end of the course, the student would have gathered knowledge of various aspects of medical psychology essential for him to apply in the clinical scenario during his clinical postings.

## UNIT- 1

Introduction to Psychology
Intelligence Learning, Memory, Personality, Motivation

## UNIT- 2

Body Integrity – one's body image

The patient in his Milen

## UNIT- 3

The self-concept of the therapist, Therapist-patient relationship – some guidelines Illness, its impact on the patient

## UNIT- 4

Maladies of the age and their impact on the patient's own and others concept of his body image

## UNIT- 5

Adapting changes in Vision

Why Medical Psychology demands commitment

**TEXT BOOK**:

1. Patricia Barkway. Psychology for health professionals, 2nd edition, Elsevier, 2013

Department of Optometry

Era University, Lucknow

**Course Outline**

**Effective From: 2023-24**

| | | | | | |
|---|---|---|---|---|---|
| **Name of theProgram** | **Bachelor of Optometry** | | | **Year/ Semester:** | **2nd/4th** |
| **CourseName** | Medical Psychology | **Course Code:** | **BOT407** | **Type:** | Regular |
| **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 this course is to provide the students understanding about the various aspects of medical psychology essential for the optometrist. | | | | |

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

| | |
|---|---|
| **Course Outcome (CO)** | At the end of the course, the student would have gathered knowledge of various aspects of medical psychology essential for him to apply in the clinical scenario during his clinical postings. |
| **CO1** | Understanding the basic about psychology. |
| **CO2** | Understanding the concept of body integrity and the patient in his milen |
| **CO3** | Understanding about common self-concept of the therapist, illness and its impact |
| **CO4** | Understanding about maladies of the age and their impact on the patient |
| **CO5** | Understanding about adapting changes in vision |
| **Internal EvaluationMode** | Class test+ weekly assignment<br>Attendence<br>Tutorial<br>Role play<br>Active learning |

| **Unit NO.** | **Title of the unit** | **Topic of unit** | **Hours** | **Mapped CO** |
|---|---|---|---|---|
| **Unit 1** | **INTRODUCTION TO PSYCHOLOGY** | 12. Basic concept of psychology<br>13. Intelligence<br>14. Learning and memory<br>15. Personality<br>16. Motivation | 6 | CO1 |
| **Unit 2** | **BODY INTEGRITY** | 1. Introduction about body integrity<br>2. The patient in his milen | 6 | CO2 |

| | | | | |
|---|---|---|---|---|
| **Unit 3** | **THERAPIST-PATIENTS RELATIONSHIP** | 34. Self-concept of therapist<br>35. Therapist-Patient relationship<br>36. Brief about Illness<br>37. Its impact on the patient | 6 | CO3 |
| **Unit 4** | **MALADIES OF THE AGE** | 25. Introduction about Maladies<br>26. Impact on the patient's own<br>27. Concept of his body image | 6 | CO4 |
| **Unit 5** | **DEMANDS OF MEDICAL PSYCHOLOGY** | 23. Adapting changes in vision<br>24. Why medical psychology demands commitment | 6 | CO5 |

**CO-PO and PSO Mapping**

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

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

**Suggested Readings:**

| | |
|---|---|
| **Text- Books** | 3. Patricia Barkway. Psychology for health professionals, 2nd edition, Elsevier, 2013 |
| **Reference Books** | |

**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<br>75-85 2 MARKS<br>85-95 3 MARKS<br>>95 % 4 MARKS |
| **Total Marks** | **30** | |

**Course created by: SALAL MOHAMMAD (AP)**

**Signature:**

**Approved by:**

**Signature:**

# FOURTH SEMESTER

| L | T | P | C |
|---|---|---|---|
| - | - | 8 | 4 |

## COURSE/ PAPER – CLINICAL OPTOMETRY III

**SUBJECT CODE- BOP-408** **Credit: 4**

Students will improve their skills in clinical procedures, and then progressive interactions with patients and professional personal are monitored as students practice optometry in supervised setting. Additional area includes problem solving and complications of various managements will be inculcated. Students should have exposure to eye bank facilities and must be made aware of eye donation, collection of eyes, preservation, pre and post-operative instructions and latest techniques for preservation of donor cornea. The students will get clinical training on the practical aspects of the following courses namely optometric optic –II & dispensing optics, visual optics – II and ocular disease -II.

**Module I**:

**Unit of competency: Refraction**

- An understanding of methods of assessing vision, Refraction in all Patients
- The ability to relate facial anatomy to the fitting of optical appliances.

**Elements of competence:**

1. Recording VA
2. Practice of Streak Retinoscopy and dynamic retinoscopy.
3. Subjective refraction –
4. Initial sphere check.: fogging
5. Cylinder axis and power refinement: clockdial, fan, JCC,
6. Second sphere check , Duocchrome or bichrome test,
7. Binocular balance :prism balance, TIB,
8. cyclodeimia,
9. Slit refraction.
10. Presbyopic add determination
11. Writing prescription
12. Overview of the use of cycloplegic drugs.

**Module : II**

**Unit of competency: Applied Optics:**

- The ability to dispensing appropriate appliances

- ❖ The ability to interpret and dispense a prescription using appropriate lenses and facial frame measurements.

**Elements of competence:**

1. Frame types and nomenclature of frames. Know about special frame features and handling the frames.
2. Relationship between frame ,lenses and face
3. IPD measurement (with Scale and IPD ruler , Pupilometer)
4. Recommends and dispenses special optical appliances where appropriate( e.g. VDU users, Sports, safety, pediatric frames, recumbent, reversible, flips, trigeminal spectacles etc.)
5. Identification of tints & Coating on lens surface and its application ,associated advantage and disadvantages.
6. Taking and recording children's facial and frame measurement
7. Awareness of the dermatological effects of the materials to be able to advise patient accordingly.
8. Identifies possible errors in prescription and follows the appropriate course of action.
9. Identification of incomplete, inaccurate and ambiguous prescription.
10. when to modify and when to refer a new prescription

**Mudule: III**

**Unit of competency: Progressive addition lens**

- ❖ Brief overview of PAL'S and clinical decision making.
- ❖ An understanding of refractive prescribing and management decisions

**Elements of competence:**

1. Know Basic construction of progressive addition lens.
2. Frame selection for Progressive
3. Familiarity of different types of progressive lens design and clinical relevance .advantages and disadvantages of different types of lens.
4. Choosing the right type of progressive lens
5. Progressive lens fitting measurement
6. Progressive lens verification.
7. Progressive dispensing
8. Trouble shooting of progressive.
9. Familiarity of different brands of PAL's.

**Module IV:**

**Unit of competency:Comprehensive eye care:**

- The ability to identify and manage ocular abnormalities
- The ability to identify sight threatening eye diseases
- Recognizes common ocular abnormalities referred when appropriate
- Recognizes adverse ocular reactions to medication
- Assess symptoms and signs of neurological significance

**Elements of competences:**

1. Understands the risk factors for developing common ocular conditions including: Glaucoma, cataract, diabetic retinopathy and ARMD .

2. Recognizes, using appropriate technique/s, all of the following: Cataract, Glaucoma or glaucoma suspects ,Anterior eye disorders e.g. blepharitis, dry eye, meibomian gland dysfunction, lid lesions

AMD and macular abnormalities and Manages appropriately.

3. Manages patients presenting with cataract.

4. Evaluates glaucoma risk factors, to detect glaucoma and refer accordingly.

5. Recognize the patients presenting with macular degeneration .

6. Recognizes, evaluates and manages diabetic eye disease and refers accordingly.

7.Evaluates and manages patients presenting with symptoms of retinal detachment.

8. Recognizes ocular manifestations of systemic disease

9. Assesses symptoms and signs of neurological significance

10. Recognizes adverse ocular reactions to medication.

**Module V**

**Unit of competency: Ocular diseases 1.**

- The ability to identify and manage ocular abnormalities
- The ability to identify sight threatening eye diseases
- Recognizes common ocular abnormalities referred when appropriate
- Recognizes adverse ocular reactions to medication

Elements of competences:

1. Interprets and investigates the presenting symptoms and sign of the patient.

2. Identifies external pathology and offers appropriate advice to patients not requiring referral.

- External eye and ocular surfaces : Lids, lashes, lumps/bumps and red eye
- Gives the correct advice /treatment and review period
- Aware of pharmaceutical agents available (legal status, indications, contraindications and side effects and uses appropriate sources of medicines information)
- Explains clearly to the patient and checks their understanding .

3. Recognizes common ocular abnormalities
4. Understanding of symptoms associated with internal eye disease.
5. Manage patient presenting with Red eyes.