

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
(Formerly West Bengal University of Technology)

Syllabus for Bachelors in Optometry Programme
(Effective for Students Admitted in Academic Session 2018-2019)
3rd SEMESTER

Paper: VISUAL OPTICS (OPTICS III)

Code: BO -301

Contact: 3L+0T

Credits: 3

Course Content	
UNIT/MODULE 1	<ul style="list-style-type: none"><input type="checkbox"/> Schematic and reduced eyes and their properties.<input type="checkbox"/> Optical constants of the eye and their measurement. Purkinje images. Corneal curvature and thickness. Indices of aqueous and vitreous.
UNIT/MODULE 2	<ul style="list-style-type: none"><input type="checkbox"/> Optical Defects of the Eye- Optical axis, Visual axis (angle alpha, Fixation axis (angle gamma), Aberration of the Optical system of eye, Depth of focus, Diffraction & resolving power.<input type="checkbox"/> Emmetropia and ametropia, Axial versus spherical ametropia, Myopia Hypermetropia(Hyperopia) Astigmatism. Aphakia, Anisometria, Anisokonia, Genetical aspects of refractive error.
UNIT/MODULE 3	<ul style="list-style-type: none"><input type="checkbox"/> Presbiopia-near vision addition- estimate of addition-unequal near vision addition- effect of changing the spectacle distance – hypermetropia and accommodation.

Reference Books:

1. *PRINCIPLES & PRACTICE OF REFRACTION, DUKE ELDER*
2. *A TEXT BOOK OF VISUAL OPTICS – GOUTAM DUTTA*

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Paper: BINOCULAR VISION & OCULAR MOTILITY

Code: BO -302

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE 1	Grades of binocular vision Retinal Correspondence
UNIT/MODULE 2	Monocular cues Stereopsis and its tests
UNIT/MODULE 3	Accommodation convergence and its anomalies Anisometropia and Anisokonia
UNIT/MODULE 4	Binocular anomalies Ocular Movements

Reference books:

1. ANATOMY AND PHYSIOLOGY OF EYE- A.K.KHURANA,INDU KHURANA

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Paper: MICROBIOLOGY AND PATHOLOGY (GENERAL AND OCULAR)

Code: BO -303

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE 1	<p>1. Bacteria Cell structure, classification of bacteria. Staining reactions— gram staining, spore staining, acid fast staining. Bacterial growth-nutritional requirement, physical factors affecting. Culture media, growth curve. Bactericidal agents- phenol, alcohol, ETC Sterilization-principles, types, methods . Brief idea about general and Ocular antibiotics.</p> <p>2. Structure and functions of immune system Structure and functions of immune system. Structure and functions of thymus, spleen, red bone marrow.</p>
UNIT/MODULE 2	<p>3. Virus Elementary knowledge of viral morphology, viral genome and classification, viral replication, Herpes, Hepatitis and HIV virus.</p> <p>4. Immunity Immunity and its types. Cell mediated and humoral immunity-mechanism. Antigen and antibody. Theories of Ab formation. Specific and Non-specific immunity.</p> <p>5. Graft rejection and cornea</p>
UNIT/MODULE 3	<p>6. Inflammation: Types of inflammation. Changes associated with inflammation. Role of mast cell and platelet in inflammation</p> <p>7. Antimicrobial chemotherapy. AIDS and related eye problem. BLEPHARITIS, KERATITIS, CONJUNCTIVITIS- brief overview</p> <p>8. Wound healing-types, mechanism, factors regulating wound healing. Abnormalities in wound healing</p>
UNIT/MODULE 4	<p>Hypersensitivity-Type I, II, III, IV 10. Autoimmunity-mechanism 11 Ocular histology- Cornea and Conjunctiva</p>

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	12. Disorders of growth -metaplasia, dysplasia, neoplasia 13. Circulatory disturbance: Thrombosis, infarction, ischaemia, embolism, calcification
UNIT/MODULE 5	Ocular Pathology: Corneal scraping, Conjunctival swab test

Reference books:

1. A TEXT BOOK OF MICROBIOLOGY-P.CHAKRABORTY,
2. CONCISE PATHOLOGY- CHANDRASOMA,
3. A SHORT TEXT BOOK OF MEDICAL MICROBIOLOGY-SATISH GUPTA

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Paper: PHARMACOLOGY (GENERAL AND OCULAR)

Code: BO -304

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE 1	<p>General Pharmacology:</p> <p>Nature & Sources of drug. Routes of drug administration (general & Ocular). New drug delivery systems. Absorption & Bio availability of a drug. Distribution of a drug. Fate of a drug. Drug excretion & toxicity. Pharmacokinetics of drugs.</p> <p>Drug action→ site of drug action, structure activity relationship. Drug receptor. Mechanism of action of a drug. Dose response relationship. Adverse drugs reactions (ADR) in man, Manifestations of ADR. Treatment of Acute drug poisoning. Factors influencing drug metabolism & drug action. Classification of drugs.</p>
UNIT/MODULE 2	<p>☐ Drug action on the nervous system→ General Considerations. Aliphatic Alcohol's. General Anesthetics. Sedatives, Hypnotics and Pharmacotherapy of Insomnia. Drugs Effective in Convulsive Disorders. Opioid Analgesics. Analgesic – Antipyretics and Nonsteroidal Anti- inflammatory Drugs(NSAID). Central Nervous System Stimulants. Local Anesthetics→ Cocaine, Procaine and Other Synthetics Local Anesthetics. Autonomic Nervous System → General Considerations. Adrenergic and Adrenergic Blocking Drugs.</p>
UNIT/MODULE 3	<p>Ocular</p> <p>☐ Ocular penetration & ophthalmic drug delivery system</p> <p>Topical anesthetics</p>
UNIT/MODULE 4	<p>☐ Ophthalmic Drugs –</p> <p>Therapeutic: antibiotics, antiviral, antifungal, corticosteroids, viscoelastics agents. Antiglaucomic drugs, Ocular NSAIDS, Ocular lubricants, cytokines, Anti VEGF, Ocular antihistamine</p> <p>Diagnostics: Cyclopegic and mediatics, Ophthalmic Dyes.</p>

Reference books:

1. ESSENTIALS OF MEDICAL PHARMACOLOGY- K.D. TRIPATHY,
2. OCULAR THERAPEUTICS- ASHOK GARG

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Paper: OPTICAL AND OPHTHALMIC INSTRUMENTATION AND PROCEDURE-1

Code: BO -305

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE1	Detailed study of the Principles of operation, types, optical properties, constructions, adjustments and applications of the following Instruments and Devices: <ul style="list-style-type: none"><input type="checkbox"/> Telescopes: Optics & Dispensing<input type="checkbox"/> Color Vision Test<input type="checkbox"/> Radiuscope<input type="checkbox"/> Retinoscopes
UNIT/MODULE 2	<ul style="list-style-type: none"><input type="checkbox"/> Standard Tests Charts: Visual Acuity, contrast sensitivity and projection chart<input type="checkbox"/> Autorefractometer- subjective and objective types<input type="checkbox"/> Ophthalmoscopes- Direct
UNIT/MODULE 3	<ul style="list-style-type: none"><input type="checkbox"/> Slit lamp Biomicroscope- anterior segment<input type="checkbox"/> Keratometer<input type="checkbox"/> Lensometer
UNIT/MODULE 4	<ul style="list-style-type: none"><input type="checkbox"/> Trial case lenses-best forms.<input type="checkbox"/> Trial frame design.<input type="checkbox"/> Cross cylinder.

Reference books-

1. *THEORY AND PRACTICE OF OPTICS AND REFRACTION- A.K.KHURANA*

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PRACTICAL SYLLABUS

Paper: MICROBIOLOGY & PATHOLOGY

Code: BO-391

Contact: 2P

Credits: 2

1. Gram Staining of bacteria
2. Autoclaving of instruments and Glassware
3. Staining with Eosin Haematoxylin Leishmann Stain etc. -(Demonstration).

Paper: OPTICAL AND OPHTHALMIC INSTRUMENTATION AND PROCEDURE-1

Code: BO-392

Contact: 2P

Credits: 2

To study the operations of the following instruments:-

1. **Lensometer.**
2. **Retinoscope.**
3. **Standard Test Charts.**
4. **Autorefractometer.**
5. **Slit Lamp Examination- Anterior Segment**
6. **Keratometer.**
7. **DirectOphthalmoscope.**