

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)

4th SEMESTER

Paper: INTRODUCTION TO VISION SCIENCE

Code: BO -401

Contact: 2L+0T

Credits: 2

Course Content	
UNIT/MODULE1	Neurophysiology 1. Geneculate cortex: a. Structure of geneculate cortex. b. Electrophysiology c. Projection – retinal projection d. Detail idea about visual cortex & function of visual cortex. 2. Higher visual pathways(primary visual Pathway to cerebral center, Lateral Geniculate body, non-geniculate targets for retinofugal input, visual center)
UNIT/MODULE 2	3. Contrast Sensitivity – Types- (spatial & Temporal contrast sensitivity), Neural Mechanism, Measurement of contrast sensitivity (Arden gratings , Cambridge low contest gratings, Pelli – Robson chart) 4. Visual stimulus, photometry and spectral sensitivity.
UNIT/MODULE 3	5. Visual perception –Temporal and Spatial properties of visual function, Spatial analysis, Spatial vision, Spatial modulation thresholds, Double pathway to higher visual centers. Visual Discrimination, attention & cognition. Higher integrative activity, Binocular perception, stereoscopic depth perception. 6. Motion perception, perceptual organization and visual illusion.
UNIT/MODULE 4	7. Electrodiagnostic tests – ERG, EOG, VER 8. Visual psychophysics and its clinical application in measuring visual function 9. Vision Changes with age and disease 10. Newer developments in Vision science

Reference Books

1. *GOLDSTEIN E.B. SENSATION & PERCEPTION*
2. *PALMER S.E. : VISION SCIENCE: PHOTONS TO PHENOMENOLOGY*
3. *BRUCE, GREEN & GEORGESON : VISUAL PERCEPTION*
4. *SEKULER R. & BLAKE R.: PERCEPTION*
5. *MATHER G.: ESSENTIALS OF SENSATION AND PERCEPTION*

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)

Paper: OCULAR DISEASE-1 (ANTERIOR SEGMENT DISEASE)

Code: BO - 402

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE1	<ul style="list-style-type: none"><input type="checkbox"/> Anterior segment ocular diseases involving orbit, eyelids, adnexa, conjunctiva, cornea, urea, sclera, anterior chamber, iris and lens. Symptomatology, clinical signs, diagnosis, pathogenesis, pathophysiology , systemic disease relationships and treatment of degenerative, infections and inflammatory conditions affecting these structures.<input type="checkbox"/> Disease of the Lids -<input type="checkbox"/> Diseases of the Lacrimal Apparatus-.<input type="checkbox"/> Disease of the Conjunctiva
UNIT/MODULE 2	<ul style="list-style-type: none"><input type="checkbox"/> Disease of the Cornea<input type="checkbox"/> Disease of the Sclera
UNIT/MODULE 3	<ul style="list-style-type: none"><input type="checkbox"/> Disease of the Iris<input type="checkbox"/> Disease of the Ciliary Body
UNIT/MODULE 4	<ul style="list-style-type: none"><input type="checkbox"/> Glaucoma- Types and its Management (Basics Steps of Surgical Procedure) Disease of the Lens - its Management (Basics Steps of Surgical Procedure)

Reference books:

1. CLINICAL OPHTHALMOLOGY- JACK J KANSKI

2. ESSENTIALS OF OPHTHALMOLOGY- SAMAR KUMAR BASAK

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)

Paper: CLINICAL REFRACTION- I

Code: BO -403

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE 1	<ol style="list-style-type: none"> Ophthalmic Case Historian: Demographic data, chief complaints, secondary complaints, ocular history, medical history, drugs and medications, family ocular history, family medical history, social history, review of system, few example of history writing. Objective Refraction: Streak Retinoscopy - all procedures to use streak retinoscope; static and dynamic retinoscopy, different methods of dynamic retinoscopy - MEM, Nott's, Sheard's, Low and high neutral, Bells, Cross, Taits. Other methods of retinoscopy-Radical, Near(Mahandra), Chromoretinoscopy, String Lensbar, use of objective and autorefractor.
UNIT/MODULE 2	<ol style="list-style-type: none"> Subjective Refraction: Monocular Distance - Classic fogging, testing of astigmatism under fog fixed astigmatic dial (clock dial), rotary astigmatic dial, combination of fixed and rotary dial (Fan and Block test), J.C.C. Duochrome or Bichrome, Binocular balancing - alternate occlusion, prism dissociation, dissociated duochrome balance, Borish dissociated fogging, equalization Binocular Distance - T.I.B. (Turville Infinity Balance), Polarized - Target and polarized filter, fogging.
UNIT/MODULE 3	<p>Near subjective refraction.</p> <p>Cycloplegic refraction, cycloidemia, sudden unfogging ,Borish delayed spherical end point, pinhole estimation of refractive error, stenopaic slit refraction, measurement of vertex distance, distometer, use of subjective autorefractor. Different methods of measuring amplitude of accommodation.</p>
UNIT/MODULE 4	<p>Correction of Presbyopia - Different methods of stimulation of tentative presbyopic addition - amplitude of accommodation, J.C.C., NRA-PRA balance, Bichrome, Plus Build -up, based on age, Dynamic retinoscopy. Occupational consideration, finalization of odd for near and intermediate-different options of correction.</p> <p>Measurement of IPD and significance.</p> <p>Final discussion with the patient.</p>

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)

	Writing prescription of power and counseling
--	--

Reference book: *BORISH'S CLINICAL REFRACTION*

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)

Paper: OPHTHALMIC LENS AND DISPENSING OPTICS

Code: BO-404

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE 1	<p>Ophthalmic lens :</p> <p>1.Characteristics of lenses: Introduction. Spherical lenses. Plano-cylindrical lenses. Sphero-cylindrical lenses. Designation of lenspower. Power of lenses. Transposition. Base curve of spherical lens. Base curve of cylindrical single vision lens. Prism prescription and its application in dispensing.</p> <p>2.Spectacle lenses: Characteristics of lens materials. Specific gravity (weight). Refractive index. Abbe number. Impact resistance. Scratch resistance.Curve variation factor.</p> <p>3.Current materials: Crown glass. CR-39. High –index glass. High –index plastic. Poly carbonate. Photochromatic materials. trivex</p>
UNIT/MODULE 2	<p>4.Lens types: Single vision lens. Bi-focal lenses. Concept of Tri-focal lenses. progressive lenses.</p> <p>5.Ophthalmic lens coating: Anti- reflecting coatings. Special notes concerning anti-reflecting coatings. Protective coating, color coating. Mirror coating.</p> <p>6.Absorptive lenses: Classification of lens tints. Chemical that produces color& assist in absorptive characteristics of glass lenses. Effect in prescription on lens color. Availability of tinted lenses.</p>
UNIT/MODULE 3	<p>7.Impact resistant lenses: Types of impact resistant lenses. Plastic lenses. Impact resistant Dress-Eye wear lenses. Tempered glass lenses. Types of impact resistant lenses most beneficial of specific patients.</p> <p>8.Lens for special uses: Fresnel lenses. Thinlite lenses. Lenticular Lenses. Aspheric</p>

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)

	lenses. Atoric Lens, Introduction to filter 9. Fundamentals of Lens surfacing & quality.
UNIT/MODULE 4	Basics of dispensing: 1. Spectacle frame : Types, Materials, Measurement & Selection 2. Lens Selection: a) Ground rule for selection b) Selection criteria 3. Facial Measurement & Measuring heights
UNIT/MODULE 5	4. Pediatric Dispensing & Management 5. Verification of trouble shooting of Lens & Frames 6. Occupational dispensing & its management

Reference book: OPTHALMIC ASSISTANT BY HAROLD A STEIN

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)

Paper: OPTICAL AND OPHTHALMIC INSTRUMENTATION AND PROCEDURE-II

Code: BO -405

Contact: 2L+1T

Credits: 3

Course Content	
UNIT/MODULE1	Principles, clinical use (methods) & significance of following instruments: <ul style="list-style-type: none"><input type="checkbox"/> Tonometer – Principles, types, clinical importance as a routine procedure (application)<input type="checkbox"/> Pachometer – Principles, types, clinical importance<input type="checkbox"/> Ultrasonography – (A scan, B scan) – Principles and application. And basics of UBM
UNIT/MODULE 2	<ul style="list-style-type: none"><input type="checkbox"/> F.F.A – Principles and demonstration of film.<input type="checkbox"/> PAM – Principles and importance.<input type="checkbox"/> Perimeter – Basics of perimetry – Humphray instruments, Automated perimetry – basics, types(names) , interpretation of normal Glaucoma Field of Definition.
UNIT/MODULE 3	<ul style="list-style-type: none"><input type="checkbox"/> LASER – Introduction – Einstein co-efficient, population inversion. Different types of LASER (mention) – Excimer, Lasik Nd-yag, Argon, Diode, He-Ne gas LASER, Xenon. LASER safety, Ophthalmic LASER application(Argon, Yag)
UNIT/MODULE 4	<ul style="list-style-type: none"><input type="checkbox"/> Basics of OCT<input type="checkbox"/> Basics of Phoropter<input type="checkbox"/> Basics of Topography<input type="checkbox"/> Slit lamp biomicroscope- Posterior segment<input type="checkbox"/> Ophtalmoscope- Indirect type<input type="checkbox"/> Gonioscopy

Reference book:

1. *OPHTHALMIC ASSISTANT BY HAROLD A STEIN*

2. *CLINICAL OPHTHALMOLOGY- JACK J KANSKI*

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

Practical

Paper: CLINICAL REFRACTION

Code: BO-491

Contacts: 2P

Credits: 2

- History writing
- Recording VA
- Practice of Streak Retinoscopy
- Subjective refraction – fogging, clock dial, fan, JCC, prism balance, TIB, duochrome, cyclodeimia, Slit refraction
- Measurement of amplitude of accommodation.
- Presbyopic add
- Writing prescription.

Paper: Ophthalmic Lens & Dispensing Optics

Code: BO-492

Contacts: 2P

Credits: 2

- a) Find out the meridian & optical center of ophthalmic lens
- b) Neutralization –**Hand and Lensometer**
- c) Identification of lens-spherical, cylindrical & sphero-cylindrical lenses
- d) Marking of single vision, bifocal , progressive
- e) Frame measurement: The boxing system, the datum system. Comparison of the two systems, Lens position, segment specification
- f) 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.
- g) Measuring heights :- single vision , bifocal, multifocal, progressive
- h) Pediatric dispensing :- Frame selection & marking
- i) Industry visit

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)

Paper: OPTICAL AND OPHTHALMIC INSTRUMENTATION AND PROCEDURE-II

Code: BO-493

Contacts: 2P

Credits: 2

Clinical use of the following instruments & the findings:

- Tonometer
- Slit lamp biomicroscope- Posterior segment
- Ophthalmoscope- Indirect type
- Gonioscopy
- Auto Perimeter-Normal HFA, printout interpretation
- A-scan:- Normal Print Out & analysis
- B-scan:- Normal Print Out & analysis
- OCT – Report Analysis
- Topography – Report Analysis