

# **INTEGRAL UNIVERSITY, LUCKNOW** INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

# **DEPARTMENT OF PARAMEDICAL SCIENCES**

BACHELOR OF OPTOMETRY (B.OPTOM)

**SYLLABUS** 

YEAR/ SEMESTER: II/III



### Integral University, Lucknow Department of Paramedical Sciences Study and Evaluation Scheme

Program: BOPT Sem											Semest	er-III	
S. N	Course	Course Title	Type of Paper	Period P	er hr/we	eek/sem	l	Evaluatio	n Scheme	_	Sub.	Credit	Total
14.	code	course rule	orraper	L	Т	Р	СТ	ТА	Total	ESE	Total	create	Credits
	THEORIES												
1	B0201	Optometric Optics-II	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	B0202	Visual Optics-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
3	B0203	Optometric Instruments	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	B0204	Ocular Diseases-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
5	BO205	General & Ocular Pathology/Microbiology	Core	2	1	0	40	20	60	40	100	2:1:0	3
6	ES101	Environmental Studies	Core	2	1	0	40	20	60	40	100	2:1:0	3
					PRACTI	CAL							
1	B0206	Optometric Optics-II - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	BO207	Visual Optics-I - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	B0208	Optometric Instruments - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
		Total	16	06	06	360	180	540	360	900	25	25	

c							United Nation				
3. N.	course code	Course Title	of Paper	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	Development Goal (SDGs)
		THEORIES									
1	B0201	Optometric Optics-II	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
2	B0202	Visual Optics-I	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
3	B0203	Optometric Instruments	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
4	B0204	Ocular Diseases-I	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
5	BO205	General & Ocular Pathology/Microbiology	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
6	ES101	Environmental Studies	Core					$\checkmark$			6,13,14,& 15
		PRACTICAL									
1	B0206	Optometric Optics-II - Lab	Core	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			$\checkmark$	3,4
2	B0207	Visual Optics-I - Lab	Core	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	3,4
3	B0208	0208 Optometric Instruments - Lab Co					$\checkmark$				3,4

L: LectureT: TutorialsP: PracticalCT: Class TestTA: Teacher AssessmentESE: End Semester Examination,AE= Ability enhancement, DSE- Discipline Specific Elective, Sessional Total: Class Test + Teacher AssessmentTA: Teacher AssessmentSubject Total: Sessional Total + End Semester Examination (ESE)



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Effective from S	Effective from Session: 2019-20											
Course Code	BO201	Title of the Course	<b>OPTPMETRIC OPTICS-II</b>	L	Т	Р	С					
Year	II	Semester	III	3	1	0	4					
Pre-Requisite	Nil	Co-requisite Nil										
Course Objectives	Skills/knowledge to be a used to make lenses and frames –manufacture pro	cquired at the end of this its characteristics. Lens d ocess & materials.	course: To select the tool power for grinding process. Differ lesigns–Bifocals, progressive lens. Tinted, Protective & Spe	ent typ cial ler	pes of r nses. Sp	naterial ectacle	S					

	Course Outcomes										
CO1	Understanding to select the tool power for grinding process.										
CO2	Understanding about different types of materials used to make lenses and its characteristics.										
CO3	Understanding about Spectacle frames, various Lens designs,										
CO4	Analyzing various dispensing spectacle lens and frames based on the glass prescription										
CO5	Evaluating various facial measurements - Inter papillary distance measurement and measuring heights (single vision, multifocal, progressives)										

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	OPHTHALMIC LENS	<ol> <li>Raw materials - History and General Outline.</li> <li>Manufacturing of Ophthalmic Blanks – Glass &amp;Plastics.</li> <li>Terminology used in Lens Workshops.</li> <li>Surfacing process from Blanks to lenses.</li> <li>Definition &amp; Materials (Glass, Plastics, Polycarbonate, Trilogy) types and Characteristics.</li> <li>Properties (Refractive index, specific gravity, UV cut off, impact resistance – include drop ball test, abbe value, Centre thickness.</li> </ol>	8	CO1
2	LENS STANDARD	<ol> <li>Best form of lenses &amp; Safety standards for Ophthalmic lenses (FDA, ANSI, ISI, Others).</li> <li>Design of High-Powered Lenses, Hi-index lenses.</li> <li>Calculation of Refractive index Aspheric lenses.</li> <li>High index lenses, Bifocal designs, their manufacturing &amp; uses (Kryptok, Univis D, Executive, Invisible, Occupational).</li> </ol>	8	CO2
3	CORRECTIVE LENSES	<ol> <li>Progressive Addition Lenses.</li> <li>Modified near vision lenses (designs, advantages, limitations).</li> <li>Lens enhancements (Scratch resistant coatings – spin/dip, Anti-reflection</li> <li>Coating, UV coating, Hydrophobic coating, anti-static coating.</li> <li>Lens defects – Description and Detection.</li> </ol>	8	CO3
4	SPECIALITY	<ol> <li>Glazing &amp; edging (manual &amp; automatic).</li> <li>Special lenses: (i) Lenticulars. (ii) Aspheric. (iii) Fresnel lenses &amp; Prisms. (iv) Aniseikonia lenses. (v) Photochromic. (vi) Polaroids. (vii) Tinted lenses – Tints, filter</li> <li>Tinted lenses – absorptive properties.</li> <li>Tinted lenses – examples and discussions, Special purpose lenses.</li> </ol>	8	CO4
5	SPECTACLEFR AMES	<ol> <li>Components of spectacle prescription &amp; interpretation, transposition, Add and near.</li> <li>Frame selection -based on spectacle prescription, professional requirements, age group, face shape.</li> <li>Neutralization -Hand &amp; lensometer, axis marking, prism marking.</li> <li>Faults in spectacles (lens fitting, frame fitting, patients' complaints, description.</li> <li>Final checking &amp; dispensing of spectacles to customers, counseling on wearing &amp; maintaining of spectacles, Accessories -Bands, chains, boxes, selves, cleaners, screwdriver kit.</li> <li>Special types of spectacle frames: Monocles, Ptosis crutches, Industrial safety glasses, Welding glasses</li> </ol>	8	CO5
Refere	nce Books:			
1. Jalie	MO: Ophthalmic lens an	nd Dispensing, 3 <sup>rd</sup> edition, Butterworth–Heinemann,2008.		
2. Tro	E. Fannin, Theodore Gr	osvenor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996.		
3. CW	Brooks, IM Borish: Sys	tem for Opninalmic Dispensing, Stdedition, Butterworth – Heinemann, 2000		
e-Les	rning Source:			
1 1.44	/			

 1.https://www.youtube.com/watch?v=driy5uzFzb4

 2. https://www.youtube.com/watch?v=p45nuwPe5KU

 3. https://www.youtube.com/watch?v=ZLQS-1HTrfQ

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO- PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO																	
CO1	3	3	3	3	3	3	3	3	3	3	2	3	2	2	1	-	2
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	-	3
CO3	3	2	3	3	3	2	3	2	2	3	2	3	2	3	1	-	2
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	-	3
CO5	3	3	3	3	3	3	3	2	3	3	3	3	2	2	1	-	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title		Attributes										
		Employability	Entropropourship	Skill	Gender	Environment &	Human	Professional	No.				
BO201	OPTPMETRIC OPTICS-II	Employability	Entrepreneursnip	Development	Equality	Sustainability	Value	Ethics					
									3,4				



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Effective from Session	: 2019-20											
Course Code	BO202	Title of the Course	VISUAL OPTICS-I	L T P								
Year	II	Semester	III	3	1	0	4					
Pre-Requisite	Nil	Co-requisite	Nil									
Course Objectives	Upon completion o To gain theoretical	Jpon completion of the course, the student should be able: To understand the fundamentals of optical components of the eye. To gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.										

	Course Outcomes									
CO1	Understanding the nature and properties of the Light and Mirror.									
CO2	Understanding about the various optical constants of the eye in relation with physical properties of the eye.									
CO3	Understanding the various aspects of vision and measuring visual acuity.									
<b>CO4</b>	Having acknowledged about various optical defects of the eye.									
CO5	Analyzing about various refractive anomalies of the eye.									

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	INTRODUCTION	<ol> <li>Review of Geometrical Optics: Vergence and power.</li> <li>Conjugacy, object space and image space, Sign convention.</li> <li>Spherical refracting surface, Spherical mirror.</li> <li>Catoptrics power, Cardinal points.</li> </ol>	8	CO1
2	LIGHT PROPERTY	<ol> <li>Magnification, Light and visual function.</li> <li>Clinical Relevance of: Fluorescence, Interference, Diffraction.</li> <li>Polarization, Bi- refringence, Dichroism.</li> <li>Aberration and application Spherical and Chromatic.</li> </ol>	8	CO2
3	VISUAL OPTICS	<ol> <li>Optics of Ocular Structure.</li> <li>Cornea and aqueous</li> <li>Crystalline lens</li> <li>Vitreous</li> <li>Schematic and reduced eye</li> </ol>	8	CO3
4	OCULAR DIAGNOSIS	<ol> <li>Measurements of Optical Constants of the Eye.</li> <li>Corneal curvature and thickness.</li> <li>Keratometry, Curvature of the lens and ophthalmophakometry.</li> <li>Axial and axis of the eye, Basic Aspects of Vision.</li> <li>Visual Acuity, Light and Dark Adaptation, Color Vision, Spatial and Temporal Resolution, Science of Measuring visual performance and application to Clinical Optometry.</li> </ol>	8	CO4
5		<ol> <li>Refractive anomalies and their causes, Etiology of refractive anomalies.</li> <li>Contributing variability and their ranges.</li> <li>Populating distributions of anomalies.</li> <li>Optical component measurements.</li> <li>Growth of the eye in relation to refractive errors.</li> </ol>	8	CO5
Refe	erence Books:	ontige The Association of Pritish Ontigion 1087		
1. F	G Bennett & RB Rabbet	ts: Clinical Visual optics. 3rd edition. Butterworth Heinemann. 1998.		
3. N	A P Keating: Geometric,	Physical and Visual optics, 2nd edition, Butterworth- Heinemann, USA, 2002.		
4. H	I L Rubin: Optics for clir	nicians, 2 <sup>nd</sup> edition, Triad publishing company. Florida,1974.		
5. H	I Obstfeld: Optic in Visio	on-Foundations of visual optics & associated computations, 2nd edition, Butterworth, UK,1982		
6. V	VJ Benjamin: Borich's cl	inical refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006.		
7. 1	Grosvenor: Primary Car	re Optometry, 4thedition, Butterworth–Heinemann, USA, 2002.		
e-1	Learning Source:	vatch <sup>2</sup> vk41003tnGs		
2. ht	tps://www.youtube.com/v	watch?v=oal-b6ep6KA		
3. ht	tps://www.youtube.com/	watch?v=wiYmTAuVing		

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
СО	101	102	105	101	105	100	10,	100	10)	1010	1011	1012	1501	1502	1505	1501	1505
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-

Course Code	Course Title		Attributes S										
BO202	VISUAL OPTICS-I	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.				
		√	√	1	1		1	√	3,4				



Effective from Session	: 2019-20									
Course Code	BO203	Title of the Course	<b>OPTOMETRIC INSTRUMENTS</b>	L	Т	Р	С			
Year	II	Semester	III	3	1	0	4			
Pre-Requisite	Nil	Co-requisite	Nil							
	Upon completion of the course, the student should be able to gain theoretical knowledge and basic practical skill in handling the following instruments: Visual Acuity chart / drum Retinoscope, Trail Box, Jackson Cross cylinder, Direct onbthalmoscope, slit									
Course Objectives	lamp Biomic	roscope, Slit lamp Ophthalmo	scopy (+90, 78D), Gonioscope, Tonometer: Applanation T RG VEP EOG A –Scan Illtrasound Lensometer	onome	eter, Ke	eratome	etry,			

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Understanding and application of the refractive instrument.
CO2	Understanding & design, application and use of refractive instrument use in refraction room.
CO3	Understanding the optics and applying the basic functions of Ophthalmoscope.
CO4	Understanding the optics and applying the basic functions and importance of examination of anterior segment.
CO5	Understanding and applying the various tools to measure ocular condition.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>REFRACTIVE</b> INSTRUMENTS	<ol> <li>Optotypes and MTF, Spatial Frequency.</li> <li>Test charts standards, Choice of test charts.</li> <li>Trial case lenses, Refractor (phoropter) head units.</li> <li>Optical considerations of refractor units, Trial frame design.</li> <li>Near vision difficulties with units and trial frames.</li> </ol>	8	CO1
2	RETINOSCOPE	<ol> <li>Retinoscope – types available, Adjustment of Retinoscopes- special features.</li> <li>Objective optometers, Infrared optometer devices.</li> <li>Projection charts, Illumination of the consulting room.</li> <li>Brightness acuity test, Vision analyzer.</li> <li>Pupilometer, Potential Acuity Meter Aberrometer.</li> </ol>	8	CO2
3	OPHTHALMOSCOPES AND RELATED DEVICES	<ol> <li>Design of ophthalmoscopes –illumination.</li> <li>Design of ophthalmoscopes-viewing.</li> <li>Ophthalmoscope disc, Filters for ophthalmoscopy, Indirect ophthalmoscope.</li> <li>Tonometer, Tonometer principles, Types of tonometers and standardization. Use and interpretation of tonometer.</li> </ol>	8	CO3
4	SLIT LAMP	<ol> <li>Slit lamp systems.</li> <li>Viewing microscope systems.</li> <li>Slit lamps in production.</li> <li>Slit lamp accessories.</li> <li>Slit lamp techniques.</li> <li>Slit lamp appearances, Mechanical design instruments.</li> </ol>	8	CO4
5	FUNDUS EXAMINATION	<ol> <li>Fundus Camera, The fundus camera – principles, The fundus camera –techniques.</li> <li>External eye photography -apparatus</li> <li>External eye photography -techniques</li> <li>Corneal examination, Placido's Disc., Keratometer</li> <li>Exopthalmometer</li> <li>Orthoptic Instruments- haploscopes, home devices–pleoptics</li> </ol>	8	CO5
Refere	ence Books:			
1. Day	vid Henson: Optometric Inst	rumentations, Butterworth-Heinemann, UK, 1991.		
2. PR	Yoder: Mounting Optics in	Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002		
5. US	arning Source	bye and visual Opucal Instruments, Camoridge Offiversity Press, 1997		
11.0				

1.https://www.youtube.com/watch?v=AdKxOOzlx4Q

2. https://www.youtube.com/watch?v=aeOXtaapoJI 3. https://www.youtube.com/watch?v=2XZ7y8UF5YI

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	-	-	-	1	2	1	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	_	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-
				1 T	C	1 4*	0.1	<b>7</b> 1		1 4	2 0 1	4 4.1					

Course Code	<b>Course Title</b>		Attributes						
BO203	OPTOMETRIC INSTRUMENTS	Employability	Entrepreneursh ip	Skill Developme nt	Gender Equalit y	Environment & Sustainability	Huma n Value	Professional Ethics	No.
									3,4



Effective from Session	: 2019-20						
Course Code	BO204	Title of the Course	OCULAR DISEASES-I	L	Т	Р	С
Year	II	Semester	III	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
	At the end of the	e course the students wi	ill be knowledgeable in the following aspects of ocu	ılar d	iseases:	Etiolo	ogy,
Course Objectives	Epidemiology, Syn	nptoms, Signs, Course se	quelae of ocular disease, Diagnostic approach and Ma	nagem	ent of	the ocu	ular
	diseases.						

	Course Outcomes
CO1	Understanding the concept of different Ocular diseases of anterior segment of Eye.
CO2	Applying the concept of anatomy & Physiology of Eye while understanding the Pathology of different ocular diseases.
CO3	Utilizing the concept of clinical features of the diseases for the differential diagnosis of the anterior segment diseases.
CO4	Analyzing the concept of clinical features of the diseases for the management of anterior segment diseases.
CO5	Understanding the concept of different Ocular diseases of anterior segment of Eye.

1         Proptosis (Classification, Causes, Investigations).         2         Enophthalmos         3         Developmental Anomalies (Cranicosynostosis, Camiofacial Dysostosis, Hypertelorism, Median facial eld syndrome.         8         CO1           1         ORBIT         4. Orbital Inflammations (Perceptual cellulities, Orbital cellulities Orbital Periostitis, cavernous situs Thromobosis.         8         CO1           2         Orbital tumors.         0. Orbital tumors.         11. Approach to a patient with proptosis.         8         CO2           2         LIDS         Orbital tumors.         10. Orbital tumors.         11. Approach to a patient with proptosis.         8         CO2           2         LIDS         Inflammatory disorders (Biopharitis, External Hordeolum, Chalazion, Internal hordeolum, Mollascun Contagiosun).         8         CO2           3         CONJUNCTTA         Degenerative conditions (Hyperenria, Chemosis, Echymosis, Xerosis, Discoloration).         8         CO3           4         CORNEA         I. Inflammations of the cornea. (Infereive conjunctivitis)         9         Colassifications (Hyperenria, Chemosis, Echymosis, Xerosis, Discoloration).         8         CO3           4         CORNEA         I. Inflammations of the cornea. (Infereive conjunctivitis)         9         Colassifications: Hyperenria, Chemosis, Relaymosis, Xerosis, Discoloration).         8         CO4	Unit No.	Title o	of the	Unit							Conte	nt of Un	it					Contact Hrs.	Mapped CO
2       I. Congenital anomalies (Prosis, Coloborna, Epicanthus, Distichiasis, Cryptophthalms)       8       CO2         2       LIDS       1. falammatory disorders (Blepharitis, External Hordeolum, Chalazion, Internal hordeolum, Mollascum Contagiosum).       8       CO2         3       I. Lacrinal System: Tear film,       5. The Dry Eye (Sjogren's Syndrome), The watering eye (Etiology, clinical evaluation), Dacrocytes, Swelling of the Lacrinal gland (Dacryoadenitis).       8       CO2         3       CONJUNCTIVA       1. Inflammations of conjunctiva (Infective conjunctivitis)       0. Degenerative conditions (Plergyclum, Concretions).       8       CO3         3       CONJUNCTIVA       2. Degenerative conditions (Plergyclum, Concretions).       8       CO3         4       VCORNEA       1. Congenital Anomalies (Megal cornea, Microcornea, Cornea Plana, Congenital cloudy cornea).       8       CO4         4       VEAL TRACT       1. Congenital Anomalies (Megal cornea, Microcornea, Cornea Plana, Colgenital, Idiopathic))       8       CO4         5       UVEAL TRACT       1. Congenital Anomalies (Megal cornea) vestilis, Vestilis white limibal girld(Hestas)       8       CO5         8       CO4       Degenerations (Lassifications, Arus seniis, Vestilis white limibal girld(Hestas)       8       CO4         1       Congenital Anomalies (Megal cornea) vestilis and Scleritis.       1. Degenerations (Lassifications, Arus senii	1	0	ORBI	Г	1. H 2. H 3. I 4. ( 5. ( 6. ( 7. ( 8. ( 9. (	<ol> <li>Enophthalmos.</li> <li>Enophthalmos.</li> <li>Developmental Anomalies (craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome.</li> <li>Orbital Inflammations (Perceptual cellulites, Orbital cellulitis Orbital Periostitis, cavernous sinus Thrombosis).</li> <li>Grave's Ophthalmopathy.</li> <li>Orbital tumors (Dermoid, capillary hemangioma, Optic nerve glioma).</li> <li>Orbital blow out fractures.</li> <li>Orbital surgery (Orbitotomy)</li> <li>Orbital tumors. 10. Orbital trauma. 11. Approach to a patient with proptosis.</li> </ol>										8	CO1		
3       CONJUNCTIVA       1. Inflammations of conjunctivitis)       8       CO3         3       CONJUNCTIVA       2. Degenerative conditions (Pinguecula, Pterygium, Concretions).       8       CO3         3       Symptomatic conditions (Pinguecula, Pterygium, Concretions).       8       CO3         4       . Orgenital Anomatics (Megalo cornea, Microcornea, Cornea Plana, Congenital cloudy cornea).       8       CO4         4       . CORNEA       1. Congenital Anomatics (Megalo cornea, Microcornea, Cornea Plana, Congenital cloudy cornea).       8       CO4         4       . CORNEA       1. Congenital Anomatics (Megalo cornea, Microcornea, Cornea Plana, Congenital cloudy cornea).       8       CO4         4       . CORNEA       1. Congenital Anomatics (Megalo cornea, Arcus senilis, Vogt's white limbal giride, Hassal-henel bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodular degeneration, Droplet keratopathy.       8       CO4         5       UVEAL TRACT AND SCLERA       Classification of uveitis, Etiology, Pathology, Anteriou Uveitis, Posterior Uveitis, Purulent Uveitis, And Scleritis.       8       CO5         8       CO5       adselritis, Clinical examination of Uveitis and Scleritis.       8       CO5         1. A K Khurana: Comprehensive Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007.       8       CO5         2. Stephen J. Miller: ParsonsDiseasesoftheEye	2	]	LIDS		1. C 2. C 3. I 4. I 5. T	Congenital anomalies (Ptosis, Coloboma, Epicanthus, Distichiasis, Cryptophthalms) Dedema of the eyelids (Inflammatory, Solid, Passive edema) nflammatory disorders (Blepharitis, External Hordeolum, Chalazion, Internal hordeolum, Molluscum Contagiosum). Lacrimal System: Tear film, The Dry Eye (Sjogren's Syndrome), The watering eye (Etiology, clinical evaluation), Dacrocytes, Swelling of the Lacrimal gland (Dacryoadenitis).										8	CO2		
	3	CONJ	UNC	TIVA	1. I 2. I 3. S 4. 0	Inflammations of conjunctiva (Infective conjunctivitis– bacterial, chlamydial, viral, Allergic conjunctivitis, Granulomatous conjunctivitis) Degenerative conditions (Pinguecula, Pterygium, Concretions). Symptomatic conditions (Hyperemia, Chemosis, Ecchymosis, Xerosis, Discoloration). Cysts and Tumors.									8	CO3			
	4	сс	DRNE	EA	1. 2. 3. 4. 5.	<ol> <li>Congenital Anomalies (Megalo cornea, Microcornea, Cornea Plana, Congenital cloudy cornea).</li> <li>Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and non- ulcerative.</li> <li>Etiological classifications: Infective, Allergic, Trophic, Traumatic, Idiopathic))</li> <li>Degenerations (classifications, Arcus senilis, Vogt's white limbal girdle, Hassal-henle bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodular degeneration, Droplet keratopathy.</li> </ol>								8	CO4				
Reference Books:         1. A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international, Ltd. Publishers, New Delhi,2007         2. Stephen J. Miller: ParsonsDiseasesoftheEye, 18 <sup>th</sup> edition, Churchill Livingstone, 1990         3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann,2007.         e-Learning Source:         1.https://www.youtube.com/watch?v=G6NukIbVwJo         2. https://www.youtube.com/watch?v=G6NukIbVwJo         2. https://www.youtube.com/watch?v=G7XwBwVh_V8         3. https://www.youtube.com/watch?v=g8_ZEQnYWM         Course Articular Matrix: (Mapping of COs with POs and PSOs)         Course Articular Matrix: (Mapping of COs with POs and PSOs)         Course Articular Matrix: (Mapping of COs with POs and PSOs)         Course Articular Matrix: (Mapping of COs with POs and PSOs)         Course 1	5	UVEA AND	L TF SCL	RACT ERA	Clas End and	sificati ophthal scleriti	on of u lmitis, s, Clini	veitis, Pan op cal exa	Etiolog hthalmi minatio	y, Path itis, Pau n of Uv	ology, A rs Planit veitis and	Anterior U is, Tumo 1 Scleritis	Jveitis, P rs of uve s.	osterior leal tract	Uveitis, P (Melanon	rurulent Uv na), Episcl	veitis, eritis	8	CO5
1. A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international, Ltd. Publishers, New Delhi,2007         2. Stephen J. Miller: ParsonsDiseasesoftheEye, 18 <sup>th</sup> edition, Churchill Livingstone, 1990         3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann,2007.         e-Learning Source:         1. https://www.youtube.com/watch?v=G6NuklbVwJo         2. https://www.youtube.com/watch?v=G6NuklbVwJo         3. https://www.youtube.com/watch?v=G6NuklbVwJo         3. https://www.youtube.com/watch?v=G7XwBwVh_V8         3. https://www.youtube.com/watch?v=SZEQnYWM         Vertex exticulation Matrix: (Mapping of COs with POs and PSOs)         PO-PSO       PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12       PS01       PS02       PS03       PS04       PS05         CO1       1       3       2       2       -       -       1       2       -       -       2       3       1       2       3       -       1       2       -       -       2       3       1       2       3       -       1       2       -       -       2       3       1       2       3       -       -       2	Refere	nce Bool	ks:																
2. Stephen J. Miller: ParsonsDiseasesoftheEye, 18 <sup>th</sup> edition, Churchill Livingstone, 1990         3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007.         e-Learning Source:         1.https://www.youtube.com/watch?v=G6NukIbVwJo         2. https://www.youtube.com/watch?v=GTXwBwVh_V8         3. https://www.youtube.com/watch?v=6TXwBwVh_V8         3. https://www.youtube.com/watch?v=6TXwBwVh_V8         3. https://www.youtube.com/watch?v=gs8_ZEQnYWM         Course Articulation Matrix: (Mapping of COs with POs and PSOs)         PO-PSO         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12       PSO1       PSO2       PSO3       PSO4       PSO5         CO1       1       3       2       2       -       -       1       2       -       -       2       3       1       2       3       -       1       2       -       -       2       3       -       1       2       -       -       2       3       1       2       3       -       1       2       -       -       2       3	1. A K	Khuran	a: Co	mprehe	nsive (	Ophthal	mology	7, 4th e	dition, 1	new age	e interna	tional, Lt	d. Publis	hers, Nev	v Delhi,20	)07			
Source:         1.https://www.youtube.com/watch?v=G6NuklbVwJo         2. https://www.youtube.com/watch?v=G6NuklbVwJo         2. https://www.youtube.com/watch?v=G6NuklbVwJo         3. https://www.youtube.com/watch?v=G6NuklbVwJo         3. https://www.youtube.com/watch?v=G7XwBwVh_V8         3. https://www.youtube.com/watch?v=g8_ZEQnYWM         Course Articulation Matrix: (Mapping of COs with POs and PSOs)         PO-PSO         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12       PSO1       PSO2       PSO3       PSO4       PSO5         CO1       1       3       2       2       -       -       1       2       -       -       2       3       1       2       -         CO2       1       3       1       3       -       -       1       2       -       -       2       3       1       2       3       -       -       2       3       1       2       2       2       2       2       2       2       2       2       2       2       2       2	2. Ste	phen J. M	liller:	Parson	sDisea	sesofth	eEye,1	8 <sup>th</sup> editi	ion, Ch	urchill	Livingst	one,1990		•	2007				
e-Learning source:         1.https://www.youtube.com/watch?v=G6NukIbVwJo         2. https://www.youtube.com/watch?v=6TXwBwVh_V8         3. https://www.youtube.com/watch?v=s8_ZEQnYWM         Course Articulation Matrix: (Mapping of COs with POs and PSOs)         PO-PSO         PO1       PO2       PO3       PO4       PO6       PO7       PO8       PO9       PO10       PO11       PO12       PSO1       PSO2       PSO3       PSO4       PSO5         CO1       1       3       2       2       -       -       1       2       -       -       2       3       1       2       3       -         CO2       1       3       1       2       -       -       1       2       -       -       2       3       1       2       3       -         CO2       1       3       1       2       -       -       2       3       1       2       3       -         CO3       1       3       1       2       -       -       1       2       -       -       2       3       1       2       2       2       2       2       2       2	3. Jac	K J. Kans	K1 Cl1	nical O	pnthal	mology	: A Sys	stematio	c Appro	bach, 6t	n edition	i, Butterv	vorth - He	einemann	1,2007.				
Port with spontation of the point of the	1 https://		outub	• e com/s	watch?	v-G6N	JukIbV	wIo											
Integration integration of the prime of the prima of the prime of the prime of the prime of	2. https://	://www.v	voutul	be.com/	watch'	$\frac{200}{2}$	XwBwV	/h V8											
V	3. https	s://www.v	youtu	be.com/	watch	v=ys8	ZEQn	YWM											
PO-PSO         PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01         PS02         PS03         PS04         PS05           CO1         1         3         2         2         -         -         1         2         -         -         2         3         1         2         3         -           CO2         1         3         1         3         -         -         1         2         -         -         2         3         1         2         3         -         -         1         2         -         -         2         3         1         2         3         -         -         2         3         1         2         -         -         -         2         3         1         2         -         -         -         3         3         -         1         2         -         -         -         2         3         1         2         2         -         -         3         3         1         1         2         2         1         2         2	r					<u> </u>		Corr	rco Arti	culation	Matriv	(Mannin	r of COc.	with POs.	and PSO a				
CO         PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01         PS02         PS03         PS04         PS05           CO1         1         3         2         2         -         -         1         2         -         2         3         1         2         3         -         -         2         3         1         2         3         -         -         1         2         -         -         2         3         1         2         3         -         -         1         2         -         -         2         3         1         2         3         -         -         1         2         -         -         2         3         3         -         1         2         -         -         2         2         1         2         2         2         1         2         2         2         1         2         2         2         2         3         1         3         2         2         2         2         2         2         2         2         2         2<	PO-P	SO			200	201	200	DOG		Doc				DOIG				Daci	
CO1       1       3       2       2       -       -       1       2       -       -       2       3       1       2       3       -       -       2       3       1       2       3       -       -       2       3       1       2       3       -       -       2       3       -       1       2       3       -       -       2       3       -       1       2       3       -       1       2       3       -       1       2       3       -       1       2       3       1       2       3       -       1       2       3       -       1       2       3       1       2       3       1       2       -       3       3       1       2       1       2       2       1       2       2       1       2       2       2       1       2       2       2       1       3       1       2       2       2       3       1       2       2       2       2       3       1       2       2       2       2       3       1       3       2       2       2       3       1		)	201	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO2       1       3       1       3       -       -       2       3       -       -       3       3       -       1       2       -         CO3       1       3       1       2       -       -       1       2       -       -       2       2       2       1       2       -         CO3       1       3       1       2       -       -       1       2       -       -       2       2       2       1       2       2       2         CO4       1       3       1       2       -       -       1       3       1       -       3       2       3       1       3       2         CO5       1       3       1       2       -       -       1       2       2       -       2       3       1       2	CO	01	1	3	2	<u>2</u> <u>2</u> <u>-</u> <u>-</u> <u>1</u> <u>2</u> <u>-</u> <u>-</u> <u>2</u> <u>3</u> <u>1</u> <u>2</u>									2	3	-		
CO3       1       3       1       2       -       -       1       2       -       2       2       2       2       1       2       2         CO4       1       3       1       2       -       -       1       3       1       -       3       2       3       1       3       2         CO5       1       3       1       2       -       -       1       2       2       -       2 <td< th=""><td>CO</td><td>2</td><td>1</td><td>3</td><td>1</td><td colspan="10">1 3 2 3 3 3 - 1</td><td>2</td><td>-</td></td<>	CO	2	1	3	1	1 3 2 3 3 3 - 1										2	-		
COT       1       3       1       2       -       -       1       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       -       3       1       2       2       2       -       2       3       1       2 <th2< th=""></th2<>		15	1	3	1	2	-	-	-	1	2	- 1	-	2	2	2	1	2	2
	CO	5	1	3	1	2	-	-	-	1	2	2	-	2	3	1	2	2	2

## 1 2 2 2 3 1 1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation Attributes & SDGs

			Attilbu	its a bbbs						
Course Code	Course Title		Attributes S							
BO204	OCULAR DISEASES-I	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.	
		$\checkmark$		Ń	1				3,4	



Effective from Session	: 2019-20										
Course Code	BO205	Title of the Course	GENERAL & OCULAR PATHOLOGY/MICROBIOLOGY	L	Т	Р	С				
Year	II	Semester	III	2	1	0	3				
Pre-Requisite	Nil	Co-requisite	Nil								
	At the end of	At the end of the course students will acquire knowledge in the following aspects: Inflammation and repair aspects. Pathology									
	of various eye parts and adnexa. To prepare the students to gain essential knowledge about the characteristics of bacteria,										
Course Objectives	viruses, fungi	i and parasites. To acquire kno	owledge of the principles of sterilization and disinfection in	hospit	al and	ophthal	mic				
	practice; To u	inderstand the pathogenesis of	the diseases caused by the organisms in the human body wi	th part	icular r	eference	e to				
	the eve infect	ions and To understand basic i	principles of diagnostic ocular Microbiology.								

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Understanding the basic concepts of infection, Inflammation and repair
CO2	Understanding the clinical features of various diseases like Tuberculosis, Leprosy, Syphilis
CO3	Understanding the clinical features of Anemia, Leukemia, Bleeding disorders, etc
CO4	Understanding about the characteristics of bacteria, viruses, fungi and parasites.
CO5	Understanding of the pathogenesis of the diseases caused by the organisms in the human body with particular reference to the eye
	infections.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO					
1	INTRODUCTION OF PATHOLOGY	General pathology: Introduction, principle, Pathophysiology of ocular Angiogenesis, Neoplasia, Inflammation and repair.	6	CO1					
2	SPECIFIC INFECTIONS OF THE EYE	Infection in general, Specific infections, Tuberculosis, Leprosy, Syphilis	6	CO2					
3	CLINICAL PATHOLOGY	Anemia, Leukemia, Bleeding disorders, Examination of blood smears, Circulatory disturbances, Thrombosis, Infarction, Embolism.	6	CO3					
4	OVERVIEW OF MICROBIOLOGY	Introduction to microbiology, Introduction to Bacteria, Virus, Fungus and their differentiation, Types of microorganism., Sterilization and disinfection used in laboratory and hospital practice.	6	CO4					
5	INFECTIONS OF THE EYE	Common bacterial infections of the eye, Common fungal infections of the eye, Common viral infections of the eye, Common parasitic infections of the eye.	6	CO5					
Refere	ence Books:								
1. Ratna	akar: Pathology of the eye & o	orbit, Jaypee brothers Medical Publishers, 1997.							
2.COR	TON KUMAR AND ROBIN	S: Pathological Basis of the Disease, 7th Edition, Elsevier, New Delhi, 2004.							
3. SR	3. SR Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993.								
4.6.KJ	Ryan, CG Ray: Sherris Medie	cal Microbiology- An Introduction to infectious Diseases, fourth edition, Mc NGRAW HILL P	ublisher, N	ew Delhi,					
1994	MACKIE & McCartney Prac	tical Medical Microbiology.							

5. MJ Pelzer (Jr), ECS Chan, NR Krieg: Microbiology, fifth edition, TATA McGraw-Hill Publisher, New Delhi, 1993

6. BURTONG.R. W: Microbiology for the Health Sciences, third edition, J.P. Lippincott Co., St. Louis, 1988.

#### e-Learning Source:

 1.
 https://www.youtube.com/watch?v=pB26B2CXi2U

 2.
 https://www.youtube.com/watch?v=ZUZEgISkRXc&list=PLuqQ0guHqmPsYtCgspJSIo5cghJ\_0rKBe

3. https://www.youtube.com/watch?v=A6wQU4qspCc

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8		PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO/	PSO5
CO	101	102	105	104	105	100	107	100	109	1010	1011	1012	1301	1502	1505	1304	1305
CO1	1	3	2	2	-	-	-	1	2	1	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
<b>CO4</b>	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

<b>Course Code</b>	Course Title		Attributes								
BO205	GENERAL & OCULAR PATHOLOGY/ MICROPIOLOCY	Employability	Entrepreneursh ip	Skill Developme nt	Gender Equalit y	Environment & Sustainability	Huma n Value	Professional Ethics	No.		
	MICROBIOLOGI								3.4		



Effective from Session: 2019-20											
Course Code	ES101	Title of the Course	ENVIRONMENTAL STUDIES	L T							
Year	II	Semester	III	2	1	0	3				
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives	The student will and social issues	he student will be made aware of our environment in general, natural resources, ecosystems, environmental pollution nd social issues related to environment.									

	Course Outcomes									
CO1	To study about the Environment and the ECO system.									
CO2	To study about the Natural Resources.									
CO3	To study about Biodiversity and Conservation									
CO4	To study Environmental pollution, its policies and practices									
CO5	To study Human Population and Environmental Ethics.									

Unit No.	Title of the Unit	Content of Unit	Contac t Hrs.	Mappe d CO
1	INTRODUCTION TO ENVIRONMENT ANDECOSYSTEMS	Environment, its components and segments, Multidisciplinary nature of Environmental studies, Concept of Sustainability and sustainable development, Environmental movements, Ecosystem, Structure & Function, Energy flow in the Ecosystem, Ecological Pyramids and Ecological Succession.	6	CO1
2	NATURAL RESOURCES	Energy Resources: Renewable and nonrenewable, Soil erosion and desertification, Deforestation, Water: Use and over exploitation, Impacts of large Dams, Case studies.	6	CO2
3	BIODIVERSITY AND CONSERVATION	Levels of biological diversity, Hot spots of biodiversity, India as a Mega Diversity Nation, Endangered and endemic species of India, Threats to Biodiversity, Conservation of Biodiversity, Ecosystem and biodiversity services.	6	CO3
4	ENVIRONMENTAL POLLUTION, POLICIES AND PRACTICES	Environmental pollution, Solid waste management, Ill effects of fireworks, Climate change, Ozone layer depletion, acid rain and impacts on human communities and Environment. Environmental Laws: Environment Protection Act, Wildlife protection Act, Forest conservation Act, Convention on Biological Diversity (CBD), Tribal rights, Human wildlife conflicts.	6	CO4
5	HUMAN POPULATION AND THE ENVIRONMENT	Human population growth: Impacts on environment, human health and welfare, Resettlement and rehabilitation of project affected persons, Environmental ethics, Environmental communication and public awareness, case studies.	6	CO5

1. Agarwal, K.C. 2001 Environmental; Biology, Nidi Pub. Ltd. Bikaner.

Glick, H.P.1993 water in crisis, Pacific Institute for studies in dev, Environment &security, Stockholm Env, Institute, Oxford Univ, Press 473p.
 Cunningham W.P.2001.Cooper, T.H. Gorhani, E & Hepworth, Environmental encyclopedia, Jacob Publication House, Mumbai
 Clark R.S. Marine Pollution, Calderon Press Oxford (TB).
 Brunner R.C. 1989. Hazardous waste incineration, Mc Graw Hill.

Bharucha Erach, The Biodiversity of India, Mappin Pub. Pvt. Ltd., Ahemdabad-380, India.

7. De. A.K. Environmental chemistry Willey Eastern Limited.

e-Learning Source:

1. https://www.youtube.com/watch?v=zuSFs85kuJs&list=PLIC0i9IRboHb19v2dF0yuenG7xDOGJLeP

2. https://www.youtube.com/watch?v=MQuWITDDecs

3. https://www.youtube.com/watch?v=kAHy\_LdA7-4

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POS	POQ	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO/	PSO5
СО	1	102	105	104	105	100	107	100	109	1010	1011	1012	1501	1502	1305	1504	1305
CO1	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-	3	-	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-	3	-	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3

#### 1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title		Attributes								
ES101	ENVIRONMENTAL STUDIES	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
						1			3,4,11,16		



Effective from Sessio	on: 2019-20											
Course Code	BO206	Title of the Course	<b>OPTOMETRIC OPTICS- II- LAB</b>	L	Р	С						
Year	II	Semester	III	0 0 2								
Pre-Requisite	Nil	Co-requisite	Nil									
	Skills/knowledge to be acquired at the end of this course: To select the tool power for grinding process. Different types of											
Course Objectives	materials used to m	ake lenses and its char	acteristics. Lens designs-Bifocals, progressive lens. Tinte	ed, Pro	otective	& Spe	cial					
	lenses. Spectacle frames –manufacture process & materials.											

	Course Outcomes									
CO1	Understanding to select the tool power for grinding process.									
CO2	Understanding about different types of materials used to make lenses and its characteristics.									
CO3	Understanding about Spectacle frames, various Lens designs,									
CO4	Analyzing various dispensing spectacle lens and frames based on the glass prescription									
CO5	Evaluating various facial measurements - Inter papillary distance measurement and measuring heights (single vision, multifocal, progressives)									

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mappe d CO
1	OPHTHALMIC LENS MATERIALS	Ophthalmic raw materials – history and general outline. Terminology used in lens workshop. Recording and ordering of Ophthalmic lenses.	4	CO1
2	MANUFACTURING OF THE LENSES	Manufacturing of Ophthalmic blanks – Plastics. Plastic lenses – materials types and characteristics.	4	CO2
3	LENS DESIGN AND HIGH POWERED LENSES	Ophthalmic lens designs – best form lenses, Unusual Lens forms. Design of high-powered lenses.	4	CO3
4	BIFOCAL LENS	Bifocal design, types and manufacture.	4	CO4
5	FAULTS IN LENSES AND OPTOMETRIC DISPENSING	Faults in lenses: description, detection Spectacle repairs -tools, methods, soldering, riveting, frame adjustments. Measuring Inter-pupillary distance (IPD) for distance & near, bifocal height.	4	CO5
Referen	ce Books:			
1. Jalie	MO: Ophthalmic lens and Di	spensing, 3rd edition, Butterworth –Heinemann, 2008.		
2. Troy	E. Fannin, Theodore Grosve	enor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996.		
3. C W	Brooks, IM Borich: System	for Ophthalmic Dispensing, 3rdedition, Butterworth - Heinemann, 2007.		
4. Mich	ael P Keating: Geometric, P	hysical & Visual Optics, 2nd edition, Butterworth – Heinemann, 2002		
e-Lear	ning Source:			
1.https://	/www.youtube.com/watch?v	=driy5uzFzb4		
2. https:/	//www.youtube.com/watch?v	/=p45nuwPe5KU		
3. https://	//www.youtube.com/watch?v	z=ZLQS-1HTrfQ		

					Co	ourse A	rticulat	tion Ma	ntrix: (N	Iapping	of COs	with POs	and PSC	Os)			
PO-PSO	DO1	DO3	DO3		DO5	DO6	DO7	DOS	DOO	<b>DO10</b>	DO11	DO12	DSO1	DSOJ	DSO2		DSO5
СО	FOI	FO2	FUS	F04	FUS	FU0	FO/	FUo	F09	FOID	FOIL	FO12	1301	F302	1303	1504	1505
CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-

			Auribu	les & SDGs								
Course Code	Course Title		Attributes S									
BO206	OPTOMETRIC OPTICS- II- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.			
		4	4	4	1		4	4	3,4			



Effective from Session: 2019-20											
Course Code	BO207	Title of the Course	VISUAL OPTICS- I - LAB	L	Т	Р	С				
YearIISemesterIII002											
Pre-Requisite	Nil	Nil Co-requisite Nil									
Course Objectives	Upon completion of the course, the student should be able: To understand the fundamentals of optical components of the eye.										
Course Objectives	To gain theoretical	knowledge and practical	To gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.								

	Course Outcomes								
CO1	Understanding the nature and properties of the Light and Mirror.								
CO2	Understanding about the various optical constants of the eye in relation with physical properties of the eye.								
CO3	Understanding the various aspects of vision and measuring visual acuity.								
CO4	Having acknowledged about various optical defects of the eye.								
CO5	Analyzing about various refractive anomalies of the eye.								

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO				
1	VISUAL ACUITY ESTIMATION	Visual acuity, stereo acuity in emmetropia. Myopia and pseudo myopia, myopia and visual acuity	4	CO1				
2	TEST FOR ESTIMATING ACCOMMODATION AND CONVERGENCE	Measurement of accommodation: near and far points and range. Measurement of Convergence – near point and adduction and abduction range	4	CO2				
3	RETINOSCOPY	<ol> <li>Practice of Retinoscopy – Emmetropia, spherical ametropia, compound hyperopia, compound myopia</li> </ol>	4	CO3				
4	4     RETINOSCOPY: ASTIGMATISM     2. Practice of Retinoscopy – simple astigmatism, oblique astigmatism, irregular astigmatism							
5	RETINOSCOPY IN LOW         3. Practice of Retinoscopy – media opacities in low vision conditions and Interpretation of cycloplegic Retinoscopy findings           5         INTERPRETATION         3. Practice of Retinoscopy – media opacities in low vision conditions and Interpretation of cycloplegic Retinoscopy findings							
Refer	ence Books:							
1. M	P Keating: Geometric, Physical an	d Visual optics, 2nd edition, Butterworth-Heinemann, USA, 2002.						
2. HI	- Rubin: Optics for clinicians, 2nd	edition, Triad publishing company. Florida, 19/4.						
5. П 4 W	Ubstield: Optic III vision- Founda I Benjamin: Boris's clinical refrac	tion 2nd edition Butterworth Heinemann Missouri USA 2006						
5. TO	Grosvenor: Primary Care Optomet	rv.4th edition. Butterworth –Heineman. USA.2002.						
e-Le	earning Source:							
1.http:	s://www.youtube.com/watch?v=-l	x4JO03tpGs						
2. http	os://www.youtube.com/watch?v=o	pal-b6ep6KA						
3. http	os://www.youtube.com/watch?v=v	viYmTAuVimg						
		Course Articulation Matrix: (Mapping of COs with POs and PSOs)						

						burse A	rucula	uon ivia	IUTIX: (IV	rapping	of COs v	with POS	and PSC	JS)			
PO-PSO	PO1	PO2	PO3		PO5	PO6	PO7	PO8		<b>PO10</b>	PO11	PO12	DSO1	DSO3	DSO3	DSO/	DSO5
СО	101	102	105	104	105	100	107	108	109	1010	1011	1012	1301	1302	1305	1304	1305
CO1	1	3	2	2	-	-	-	1	2	1	-	2	-	2	2	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	-	1	1	1	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	-	1	1	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	2	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	1	1	-

			11001100						
Course Code	Course Title			Att	ributes				SDGs
DODOT	VISUAL OPTICS- I -	Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.
BO207	LAB	I Sources	· · I · · · · · I	Development	Equality	Sustainability	Value	Ethics	
		1	√	√	√		1	4	3,4



Effective from Session: 2019-20													
Course Code         LT208         Title of the Course         OCULAR INSTRUMENTS- LAB         L         T													
Year	Π	Semester	III	0	0	2	1						
Pre-Requisite	Nil	Co-requisite	Nil										
Course Objectives	Upon completion of following instrument lamp Biomicroscope, Perimeter, Electrodia	the course, the student s s: Visual Acuity chart / Slit lamp Ophthalmosc gnostic instrument (ER)	hould be able to gain theoretical knowledge and basic practi- drum, Retinoscope, Trail Box, Jackson Cross cylinder, Dire- copy (+90, 78D), Gonioscope, Tonometer: Applanation Tone G. VEP, EOG), A –Scan Ultrasound, Lensometer	cal ski ct opht ometer	ll in haı halmos , Kerato	ndling t cope, s ometry,	the lit						

	Course Outcomes								
CO1	Understanding and application of the refractive instrument.								
CO2	Understanding & design, application and use of refractive instrument use in refraction room.								
CO3	Understanding the optics and applying the basic functions of Ophthalmoscope.								
CO4	Understanding the optics and applying the basic functions and importance of examination of anterior segment.								
CO5	Understanding and applying the various tools to measure ocular condition.								

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
	VISUAL ACUITY	Near vision difficulties with units and trial frames	4	
1	AND REFRACTION	<b>REFRACTION</b> Adjustment of Retinoscope – special features. Special subjective test polarizing and		CO1
	AND REFRACTION	displacement etc.		
		Color vision testing devices	4	
2	SPECIAL INVESTIGATIONS	Field of vision and screening devices		CON
2		Perimeter and visual field		02
		Results of field examination		
		Vision screeners – principles	4	
3	VISION SCREENER	Vision screeners – details		CO3
		Analysis of screener results		
	ANTERIOR AND	Corneal examination- Placido's Disc., Keratometer	4	
4	POSTERIOR SEGMENT	The fundus camera – techniques		CO4
	EVALUATION			
5	MICPOSCOPE	Viewing microscope systems	4	C05
5	WICKOSCOF E	The use of ophthalmoscopes in special cases		005
Refer	ence Books:			

1. P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002.

2. G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997.

e-Learning Source:

1.https://www.youtube.com/watch?v=AdKxOOzlx4Q

2. https://www.youtube.com/watch?v=aeOXtaapoJI

3. https://www.youtube.com/watch?v=2XZ7y8UF5YI

PO-PSO         PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01         PS02         PS03         PS04         PS04 </th <th colspan="11">Course Articulation Matrix: (Mapping of COs with POs and PSOs)</th>	Course Articulation Matrix: (Mapping of COs with POs and PSOs)										
CO       FOI       FO	505										
CO1         1         3         2         2         -         -         1         2         1         -         2         -         2         2         1           CO2         1         3         1         3         -         -         2         3         -         -         2         2         1         -	303										
CO2 1 3 1 3 2 3 3 - 1 1 1 1	-										
	-										
<b>CO3</b> 1 3 1 2 1 2 2 - 2 - 1 1 1	-										
<b>CO4</b> 1 3 1 2 1 3 - 3 - 1 2 1	-										
CO5         1         3         1         2         -         -         1         2         1         -         2         -         1         1         1	-										

Course Code	Course Title			At	tributes				SDGs
BO208	OCULAR	Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.
		Employability		Development	Equality	Sustainability	Value	Ethics	
	INSTRUMENTS- LAB	4	4	4	*		7	1	3,4



# **INTEGRAL UNIVERSITY, LUCKNOW** INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

## **DEPARTMENT OF PARAMEDICAL SCIENCES**

# BACHELOR OF OPTOMETRY (B.OPTOM)

# **SYLLABUS**

# YEAR/ SEMESTER: II/IV



### Integral University, Lucknow Department of Paramedical Sciences <u>Study and Evaluation Scheme</u>

Program:	BOPT
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**Period Per Evaluation Scheme** S. Туре Course Total hr/week/sem Sub. Total of Paper **Course Title** Credit N. code Credits Т Р СТ Total ESE TA THEORIES BO209 Visual Optics-II 3:1:0 Core BO210 Ocular Diseases-II Core 3:1:0 BO211 Clinical Examination of Visual System 3:1:0 Core BO212 Low Vision Aid & Optometry Investigation 3:1:0 Core B0213 General & Ocular Pharmacology 2:1:0 Core PRACTICAL BO214 Visual Optics-II - Lab Core 0:0:1 BO215 Clinical Examination of Visual System - Lab Core 0:0:1 BO216 Low Vision Aid & Optometry Investigation - Lab 0:0:1 Core BO217 Hospital Posting-Lab 0:0:3 Core Total 

S.	Course				United Nation Sustainable						
N.	code	Course Title	of Paper	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	Development Goal (SDGs)
THEORIES											
1	B0209	Visual Optics-II	Core	$\checkmark$	$\checkmark$					$\checkmark$	3,4
2	B0210	Ocular Diseases-II	Core	$\checkmark$	$\checkmark$				$\checkmark$	$\checkmark$	3,4
3	B0211	Clinical Examination of Visual System	Core	$\checkmark$	$\checkmark$					$\checkmark$	3,4
4	B0212	Low Vision Aid & Optometry Investigation	Core	$\checkmark$	$\checkmark$				$\checkmark$	$\checkmark$	3,4
5	B0213	General & Ocular Pharmacology	Core	$\checkmark$	$\checkmark$				$\checkmark$		3,4
PRAC	TICAL										
1	B0214	Visual Optics-II - Lab	Core	$\checkmark$	$\checkmark$					$\checkmark$	3,4
2	B0215	Clinical Examination of Visual System - Lab	Core	$\checkmark$	$\checkmark$				$\checkmark$	$\checkmark$	3,4
3	B0216	Low Vision Aid & Optometry Investigation - Lab	Core	$\checkmark$	$\checkmark$					$\checkmark$	3,4
4	B0217	Hospital Posting-Lab	Core							$\checkmark$	3,4

L: Lecture T: Tutorials P: Practical CT: Class Test TA: Teacher Assessment ESE: End Semester Examination, AE= Ability enhancement, DSE- Discipline Specific Elective, Sessional Total: Class Test + Teacher Assessment Subject Total: Sessional Total + End Semester Examination (ESE)

Semester-IV



Effectiv	e from Sess	ion: 2019-20											
Course	Code	BO209	Title of the Cours	e VISUAL OPTICS- II	L	Т	P	C					
Year		II	Semester	IV	3	1	0	4					
Pre-Rec	quisite	Nil	Co-requisite	Nil									
Course Objectiv	ves	<ul><li>Upon completi</li><li>To understa</li><li>To gain the</li></ul>	ion of the course, the student should be able: and the fundamentals of optical components of the eye. eoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.										
CO1	Understan	ding about acc	commodation, its anomalies and th	eir practicalsignificance.									
CO2	Colspan="2">Colspan="2"Colspan=""2"Colsp												
<u>CO3</u>													
<u>C04</u>	Applying	ding about conv	ergence, its anomalies and their cl	inical significance.									
05	Applying	the meoretical Ki	lowledge on chinical practice.										
Unit No.	Title of	the Unit		Content of Unit	Cor H	ntact rs.	Mapp CC	ped )					
			1. Accommodation & Prest	vyopia									
			2. Far and near point of acc	ommodation									
1	ACCOM		3. Range and amplitude of a	accommodation	:	8	CO	1					
		DN	4. Mechanism of accommo	dation. Variation of accommodation with age									
			5 Anomalies of accommod	ation Preshvonia									
			1 Streak Patinoscony Prin	ciple Procedure Difficulties and interpretation offindings									
			1. Streak Kethoscopy- Film	interpretation of middles and interpretation of middles									
	OBJE	CTIVE	2. Transposition and spherica	al equivalent		~		•					
-	0.001		2 Dynamia ratinggany yari	and we at he and a	1 1	v		()					

	KEI KACHON	4. Radical retinoscopy and near retinoscopy		
		5. Cycloplegic refraction, Hypermetropia and accommodation		
3	Refraction	<ol> <li>Principle and fogging</li> <li>Fixedastigmaticdial (Clockdial), Combinationoffixed and rotator dial (Fan and block test), J.C.C</li> <li>Duo chrome test- Binocular balancing- alternate occlusion, prism dissociation, dissociate</li> <li>Duo chrome balance, Borich dissociated fogging</li> <li>Binocular refraction-Various techniques Mechanism of accommodation, Variation of accommodation with age.</li> </ol>	8	CO3
4	EFFECTIVE POWER & MAGNIFICATION	<ol> <li>Ocular refraction vs. Spectacle refraction.</li> <li>Spectacle magnification vs. Relative spectacle magnification.</li> <li>Axial vs. Refractive emmetropia, Knapp's law.</li> <li>Ocular accommodation vs. Spectacle accommodation.</li> <li>Retinal image blur-Depth of focus and depth offield.</li> </ol>	8	CO4
5	MEASUREMENTS OF OPTICAL CONSTANTS OF THE EYE	<ol> <li>Keratometry, Curvature of the lens and ophthalmophakometry.</li> <li>Spectacle magnification vs. Relative spectacle magnification.</li> <li>Axial and axis of the eye.</li> <li>Basic aspects of vision- Visual acuity, Light and dark adaptation Color vision, Septal and temporal resolution.</li> <li>Science of measuring visual performance and application to clinical optometry.</li> </ol>	8	CO5
Referen	ce Books:	· · · · · · · · · · ·		
1. Theo	dore Grosvenor: Primary	Care Optometry, 5th edition, Butterworth –Heinemann, 2007.		
2. Duke	e-Elder's practice of Refr	action.		
3. ALL	ens: 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. David B. Elliot: Clinical Procedures in Primary Eye care, 3rd edition, Butterworth - Heinemann, 2007. 6.

e-Learning Source:

https://www.youtube.com/watch?v=ELPyMozXLOU 1

https://www.youtube.com/watch?v=idQX7MBf3k8&list=PLfnnZvJNUsnogXdXVQNheEzPWGV1uHRqf 2

3 https://www.youtube.com/watch?v=dKaQB11I0z0

REFRACTION

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POS	POO	PO10	PO11	PO12	DSO1	DSO2	DSO3	DSO4	DSO5
СО	101	102	105	104	105	100	107	108	109	1010	1011	1012	1301	1302	1305	1504	1305
CO1	1	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO2	1	3	2	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO3	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1
CO4	2	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO5	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1

Course Code	Course Title		Attributes S										
		Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.				
BO209	VISUAL OPTICS- II	Linpioyaointy	Lincepteneursnip	Development	Equality	Sustainability	Value	Ethics					
		$\checkmark$	$\checkmark$				$\checkmark$		3,4				



Effective from Sessio	<b>n:</b> 2019-20										
Course Code	BO210	Title of the Course	OCULAR DISEASES-II	L	Т	Р	С				
Year	II	Semester	IV	3	1	0	4				
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives	At the end of the cou	the end of the course the students will be knowledgeable in the following aspects of ocular diseases: Etiology, Epidemiology,									
Course Objectives	Symptoms, and Signs	s, Course sequelae of oc	ular disease, Diagnostic approach and Management of the o	cular d	liseases						

	Course Outcomes
CO1	Understanding the concept of different Ocular diseases of posterior segment of Eye
CO2	Applying the concept of anatomy & Physiology of Eye while understanding the Pathology of different ocular diseases
CO3	Understanding the differential diagnosis of various ocular dsease having similar clinical features.
CO4	Utilizing the concept of clinical features of the diseases for the differential diagnosis of the ocular diseases
CO5	Analyzing the concept of clinical features of the diseases for the management of ocular diseases

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	RETINA AND VITREOUS	<ol> <li>Congenital and Developmental Disorders (Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent HyaloidArtery)</li> <li>Inflammatory disorders (Retinitis: Acute purulent, Bacterial, Virus, mycotic)</li> <li>Retinal Vasculitis (Eales's), Retinal ArteryOcclusion (Central retinal Artery occlusion)</li> <li>Retinal Vein occlusion (Ischemic, non-ischemic, Branch retinal vein occlusion)</li> <li>Retinal degenerations: Pigmentosa, Lattice degenerations, Retinoblastoma, Diabetic retinopathy.</li> <li>Macular disorders: Solar retinopathy, central serous retinopathy, cystoid macular edema, Age related macular degeneration., Retinal Detachment: Rhegmatogenous, Tractional, Exudative)</li> </ol>	8	CO1
2	OCULAR INJURIES	<ol> <li>Terminology: Closed globe injury (contusion, lamellar laceration) Open globe injury (rupture, laceration, penetrating injury, perforating injury.</li> <li>Mechanical injuries (Extraocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis).</li> <li>Non-Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational). Clinical approach towards ocular injury patients.</li> </ol>	8	CO2
3	LENS	<ol> <li>Classification of cataract, Congenital and Developmental cataract</li> <li>Acquired (Senile, Traumatic, Complicated, Metabolic, Electric, Radiational, Toxic)</li> <li>Morphological: Capsular, Subcapsular, Cortical, Supranuclear, Nuclear, Polar</li> <li>Management of cataract (non-surgical and surgical measures; preoperative evaluation, Types of surgeries)</li> <li>Complications of cataract surgery Displacement of lens: Subluxation, Displacement, Lens coloboma, Lenticonus, Microsperophakia.</li> </ol>	8	CO3
4	VISUAL PATHWAY	<ol> <li>Anatomy of visual pathway, Lesions of the visual pathway.</li> <li>Pupillary reflexes and abnormalities (Amaurotic light reflex, Efferent pathway defect, Wernicke's hemianopia pupil, Marcus gunn pupil. Argyll Robertson pupil, Adie's tonic pupil).</li> <li>Optic neuritis, Anterior Ischemic optic neuropathy, Papilledema, optic atrophy.</li> <li>Cortical blindness, Malingering.</li> <li>Nystagmus, Clinical examination.</li> </ol>	8	CO4
5	GLAUCOMA	<ol> <li>Definitions and classification of glaucoma, Pathogenesis of glaucomatous ocular damage.</li> <li>Congenital glaucoma's, Primary open angle glaucoma.</li> <li>Ocular hypertension, Normal Tension Glaucoma.</li> <li>Primary angle closure glaucoma (Primary angle closure suspect, Intermittent glaucoma, acute congestive, chronic angle closure)</li> <li>Secondary Glaucoma's, Management: common medications, laser intervention and surgical techniques.</li> </ol>	8	CO5
Refer	ence Books:			
1. A	K Khurana: Comp	rehensive Ophthalmology, 4th edition, new age international, Ltd. Publishers, New Delhi, 2007.		
2. St	ephen J. Miller: Par	sons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990		
5. Ja	CK J. Kanski Clinic	al Ophthalmology: A Systematic Approach, oth edition, Butterworth - Heinemann, 2007.		
1. P	at mig Source:	com/watch?v=annivlirat()		

2. https://www.youtube.com/watch?v=WRIbtxk4Zto

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		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3		PO5	PO6	PO7	POS	POO	PO10	PO11	PO12	DSO1	DSO2	DSO3	DSO4	DSO5
СО	101	102	105	104	105	100	107	100	109	1010	1011	1012	1301	1502	1305	1504	1305
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

Course Code	Course Title		Attributes								
BO211	OCULAR DISEASES-II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
20211		4	1	1	√	, in the second s	1	4	3,4		



Effective from Sessio	<b>m:</b> 2019-20						
Course Code	BO211	Title of the Course	CLINICAL EXAMINATION OF VISUAL SYSTEM	L	Т	Р	С
Year	II	Semester	IV	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
	At the end of the cour	se the students will be sk	illed in knowing the purpose, set- up and devices required for	r the te	st, indi	cations	and
<b>Course Objectives</b>	contraindications of	the test, step-by- step	procedures, documentation of the findings, and interpretation	on of the	he find	ings of	the
	various clinical optor	netry procedures.					

	Course Outcomes
CO1	Understanding about the process of history taking and its clinical importance
CO2	Understanding about various clinical examination test available
CO3	Analyzing the importance of pupillary examination in the field of optometry
CO4	Applying all the theoretical knowledge on practical field
CO5	Understanding about the process of history taking and its clinical importance

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO				
1	HISTORY TAKING AND VISUAL ACUITY ESTIMATION	<ol> <li>History taking</li> <li>Visual acuity estimation</li> <li>Extraocular motility, Cover teat, Alternating cover test</li> <li>Hirschberg test, Modified Krimsky</li> </ol>	8	CO1				
2	OCULAR EXAMINATION I	<ol> <li>Pupils Examination</li> <li>Maddox Rod</li> <li>Van Herrick</li> <li>External examination of the eye, Lid Eversion</li> </ol>	8	CO2				
3	OCULAR EXAMINATION II	<ol> <li>Schirmer's, TBUT, tear meniscus level, NITBUT (keratometer)</li> <li>Color Vision</li> <li>Stereopsis</li> <li>Confrontation test</li> </ol>	8	CO3				
4	OCULAR EXAMINATION III	<ol> <li>Photo stress test</li> <li>Slit lamp biomicroscope</li> <li>Ophthalmoscopy</li> <li>Tonometry</li> </ol>	8	CO4				
5	OCULAR EXAMINATION IV	<ol> <li>ROPLAS</li> <li>Amsler test</li> <li>Contrast sensitivity function test</li> <li>Saccades and pursuit test</li> </ol>	8	CO5				
Referen	ce Books:							
1. TGr	osvenor: Primary Care C	Dependency, 5th edition, Butterworth–Heineman, USA, 2007						
2. A K 3. D B.	Elliott: Clinical Procedur	es in Primary Eve Care, 3rd edition, Butterworth-Heinemann, 2007						
4. Jack	J. Kanski Clinical Oph	halmology: A Systematic Approach,6th edition, Butterworth - Heinemann, 2007						
5. NB.	Carlson, Dl Kurtz: Clin	cal Procedures for Ocular Examination, 3rd edition, McGraw-Hill Medical, 2003.		·				
6. J.B F	6. J.B Eskridge, J F. Amos, J D. Bartlett: Clinical Procedures in Optometry, Lippincott Williams and Wilkins, 1991							
7. NB.	Carlson, Dl Kurtz: Clin	ical Procedures for Ocular Examination ,3rd edition, McGraw- Hill Medical, 2003.						
e-Lear	rning Source:							
1. http	os://www.youtube.com/	watch?v=YqL6IMGE5os						
2. https:/	//www.youtube.com/wa	tch?v=SVuP5Td23AQ						
3. https:/	//www.youtube.com/wa	tch'/v=b-cFID068ng						

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3		PO5	PO6	PO7	DO8	POQ	PO10	PO11	PO12	DSO1	DSO2	DSO3	DSO/	DSO5
CO	101	102	105	104	105	100	107	100	109	1010	1011	1012	1301	1302	1305	1304	1305
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

#### 1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes	& SDGs

Course Code	Course Title		Attributes									
	CLINICAL	Employability	Entrapropaurship	Skill	Gender	Environment &	Human	Professional	No.			
BO211	EXAMINATION OF	Employability	Entrepreneursnip	Development	Equality	Sustainability	Value	Ethics				
	VISUAL SYSTEM	4	4	4	٦		1	4	3,4			



Effective from Sessio	n: 2019-20									
Course Code	BO212	Title of the Course	LOW VISION AID & OPTOMETRY INVESTIGATION L T P							
Year	II	Semester	IV	3	1	0	4			
Pre-Requisite	Nil	Co-requisite	Nil							
	At the end of th	e course the students wi	ll be skilled in knowing the purpose, set- up and devices required fo	r the te	est, indi	cations	and			
Course Objectives	contraindicatio	ons of the test, step-by-	step procedures, documentation of the findings, and interpretation	on of t	he find	ings of	the			
	various clinica	l optometry procedures.								

	Course Outcomes										
CO1	Understanding the basic definition and classification of Low Vision and Applying various optical and non-optical devices for visual										
	rehabilitation of a low vision Patient.										
CO2	Understanding how to do examination of a low vision Patient and the legal aspects of Low Vision in India, as well as applying case studies to										
	for visual rehabilitation of a low vision Patient.										
CO3	Understanding the concept of Visual Function, Visual Acuity, Color Vision, etc.										
CO4	Applying Various Techniques for Diagnosis and Management of Various Eye Ailments.										
CO5	Applying advance techniques for Evaluation of Cornea, Tear Film and Ocular Refraction.										

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	INTRODUCTION TO LOW VISION	<ol> <li>Definitions &amp; classification of Low vision, Epidemiology of low vision</li> <li>Model of low vision service.</li> <li>Pre-clinical evaluation of low vision patients – prognostic &amp; psychological factors; psychosocial impact of low vision.</li> <li>Types of low vision aids – optical aids, non-optical aids &amp; electronic devices, Optics of low vision aids.</li> </ol>	8	CO1
2	LOW VISION ASSESSMENT	<ol> <li>Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction &amp; training</li> <li>Pediatric Low Vision care, Low vision aids – dispensing &amp; prescribing aspects</li> <li>Visual rehabilitation &amp; counselling</li> <li>Legal aspects of Low vision in India, Case Analysis.</li> </ol>	8	CO2
3	SPECIAL PROCEDURES I	<ol> <li>Visual Acuity Testing &amp; Theory, Color Vision Testing &amp; Theory</li> <li>Electro Retinography, E.R.G., Electro Oculography, E.O.G.</li> <li>Fluorescein Angiography F.A., Ultrasono Graphy U.S.G.</li> <li>Visual Evoked Response / Potential V.E.R. or V.E.P.</li> <li>Tonometer, Tonometry &amp; Tonography, Visual Field Charting &amp; Perimetry</li> </ol>	8	CO3
4	SPECIAL PROCEDURE II	<ol> <li>Adaptation &amp; Adaptometry, Berman's Locator, Cryo Technique, Diathermy</li> <li>Photo-coagulation, Methods of examination (Focal illumination)</li> <li>Slit lamp and attachments, Gonioscopy</li> <li>Ocular Photography (Ant.Seg.), Contact &amp; Trans-illumination</li> </ol>	8	CO4
5	CLINICAL PROCEDURES	<ol> <li>pH Testing &amp; Schirmer's Test</li> <li>Fluorescein Staining &amp; Techniques, Syringing &amp; Lacrimal Function Test</li> <li>Ophthalmoscopy, Retinoscopy</li> <li>Auto-Refraction, Keratometry</li> <li>Ophthalmic Lens Measuring Instruments</li> </ol>	8	CO5
Referen	ce Books:			
1. T G	rosvenor: Primary Care O	ptometry, 5th edition, Butterworth –Heineman, USA, 2007.		
2. A K	Khurana: Comprehensiv	ve Ophthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007.		
3. DB. 4. Jack	J. Kanski Clinical Ophth	almology: A Systematic Approach.6th edition, Butterworth- Heinemann, 2007.		
5. J.B I	Eskridge, J F. Amos, J D.	Bartlett: Clinical Procedures in Optometry, Lippincott Williams and Wilkins, 1991.		
e-Lear	rning Source:			

https://www.youtube.com/watch?v=Sm6d4t873oI 1.

2.

https://www.youtube.com/watch?v=OmlKEGG5e-E https://www.youtube.com/watch?v=TWmaZZDgPX0 3.

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	O PO1	DOJ	DO3	DO4	DO5	DOG	DO7	DOS	DOO	<b>DO10</b>	DO11	DO12	DSO1	DSO2	DSO2	DSO4	DSOS
CO		51 102	F05	F04	FUS	FOO	FO/	FUo	F09	1010	FOIT	FO12	1301	F302	1303	1504	1303
CO1	2	-	-	1	-	3	3	2	2	-	2	2	-	-	-	-	1
CO2	2	-	-	2	-	3	2	2	1	-	2	3	-	-	-	-	2
CO3	2	-	-	1	-	3	3	1	2	-	1	2	-	-	-	-	1
CO4	2	-	-	1	-	3	3	2	1	-	2	3	-	-	-	-	1
CO5	2	-	-	2	-	3	2	2	1	-	2	2	-	-	-	-	1

Autolites & SDOS													
Course Code	Course Title		Attributes										
BO212	LOW VISION AID & OPTOMETRY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.				
	INVESTIGATION	4	4	4	٧		1	1	3,4				



Effectiv	Effective from Session: 2019-20										
Course	Code	BO213	Title of the Course	GENERAL & OCULAR PHARMACOLOGY	Т	Р	С				
Year		Ι	Semester	er IV 2							
Pre-Requisite Nil Co-requisite Nil											
	At the end of the course the students will acquire knowledge in the following aspects:										
Course	Objectives	<ul> <li>Basic pr</li> </ul>	inciple of pharmacokinetic	es & Pharmacodynamics.							
		Common	nly used ocular drugs, mecl	hanism, indications, contraindications, drug dosage and adverse et	ffects.						
								,			
				Course Outcomes							
CO1	1 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 Ocularpreparations.										

CO3	Understanding the advantages and disadvantages of general routes of drug administration and routes of drug administration
	in Ophthalmology.
<b>CO4</b>	Applying of different pharmaceutical agents in the management of Oculardisease as well as managing Ocular Toxicity.

CO5 Analyzing and applying diagnostic and therapeutic drugs in Ophthalmology.

Unit No.	Т	Title of	the Uni	it	Content of Unit											0	Contact Hrs.	Mapped CO
1	РН	GENI ARMA	ERAL COLO	GY	1. Me 2. Do 3. Ta 4. Ph 5. Fa	echanisi se-resp chyphyl armacol ctors int	ns of di onse rel axis an kinetics fluencir	ug acti ationsh d idiosy of drug ng drug	on. ips. acrasy g absorp metabo	ption, dis lism of c	stribution lrug action	, Biotran	sformati	on, excret	ion and tox	ticit	6	CO1
2	SPE	ACTI ECIFIC	ON OF CAGEN	NTS	1. De 2. C.I 3. Di 4. Ca	pressan N.S. Sti uretics a rdiovas	ts, Anti mulants and hyp cular di	-coagul and an ertensiv ugs, Hi	ants tidepre ve agent stamine	ssants ts es	5. Ser	otonin, F	Prostagla	ndins			6	CO2
3	PI PH	RINCII OCU ARMA	PLES ( JLAR COLO	)F GY	1. Ge 2. Dr 3. Fa 4. Oc	neral pr ug actic ctors inf ular per	inciple ons and fluencir netration	s of ocu effectiv ig the o n.	lar pha eness, <sup>1</sup> bjective 5. Ro	rmacolog Drug saf ely demo outes of o	gy ety instrated i ocular per	response netration					6	CO3
4	Optometric use of pharmaceuticals:         1. Classification of drug use         2. Topical ophthalmic drugs         3. References and drug indices         4. Hazards of ophthalmic drugs         5. Surface active drugs         6. topical anesthetics         Principles and classification of autonomic drugs:         1. Sympathomimetics         2. Sympatholytic         3. Parasympatholytic												g.	6	CO4			
5	ОРНТ	HALN DRUG	IOLOG S USE	GICAL	1. An • • 2. Su 3. An 4. Co	ti-glauc Drugs f Drugs tl Inhibito Ifonami tibiotic rticoste	coma dr or ocula hat enha rs of aq des s roids	ugs ar hyper ance aq ueous s 5.	tension ueous o secretion Anesthe	utflow n etics	6. Pr	oteolytic	enzvme	s			6	CO5
Refere	nce Bo	oks:																
1. KD	) Tripat	hi: Esse	entials o	f Medic	al Phari	nacolog	5  th e	dition,	laypee,	New De	lhi, 2004							
2. Ash	iok Gar Zimmer	g: Man	ual of C	ocular'l	herapeu	itics, Ja	ypee, N	ew Del	ni, 1996	)	aven 100	7						
e-Lea	arning	Source	:	101.103	DUOK	n Ocula	1 1 1141 11	acorog	y, Lippi	ncott-K	.,	1						
1. ht	tps://ww	ww.you	tube.co	m/watc	h?v=9-9	9sRHqg	ZhE											
2. ht	tps://ww	ww.you	tube.co	m/watc	h?v=2F	z935_g	C5s											
3. ht	tps://ww	ww.you	tube.co	m/watc	h?v=V0	G4s2dY	qRKc											
						Co	urse A	rticula	tion Ma	atrix: (N	Iapping	of COs	with POs	and PSO	Ds)		_	
PO-P	PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	)						2		2				2					
	$\frac{1}{2}$	-	-	-	-	-	2	-	2	-	-	-	2	-	-	-	-	-
CO	3	-	-	-	-	-	2	-	1	-	1	-	2	-	-	-	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation												
-	2	1	1	-	-	1	2	-	-			
-	2	2	-	-	-	-	2	-	-			

1

SDGs

No.

3,4, 11

	Attributes & SDGs													
Course Code	Course Title			Att	ributes									
BO213	GENERAL & OCULAR PHARMACOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics						
				2										

**CO4** 

CO5



Effective from Session	: 2019-20						
Course Code	BO214	Title of the Course	VISUAL OPTICS- II LAB	L	Т	Р	С
Year	II	Semester	IV	0	0	2	1
Pre-Requisite	NIL	Co-requisite	Nil				
	Upon completion of	f the course, the student	should be able:				
Course Objectives	<ul> <li>To understand the second second</li></ul>	he fundamentals of optic	cal components of the eye.				
	To gain theoretical	knowledge and practical	l skill on visual acuity measurement, objective and subjectiv	e clini	cal refra	action	

	Course Outcomes									
CO1	Understanding about accommodation, its anomalies and their practical significance.									
CO2	Have knowledge about retinoscopy and its procedure.									
CO3	Analyzing the importance of subjective and objective refraction.									
CO4	Understanding about convergence, its anomalies and their clinical significance.									
CO5	Applying the theoretical knowledge on clinical practice.									

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO							
1	DETINOSCODV	1. Radical retinoscopy and near retinoscopy	4	COI							
1	KETINOSCOF I	2. Streak Retinoscopy- Procedure, Difficulties and interpretation offindings		COI							
2	DYNAMIC	3. Dynamic retinoscopy various methods.	4	CO2							
-	RETINOSCOPY			002							
3	REFRACTION	4. Cycloplegic refraction, Hypermetropia and accommodation	4	CO3							
	4 SUBJECTIVE 5. Binocular refraction-Various techniques 4										
4	4 <b>REFRACTION</b> <b>TECHNIQUES</b> 6. Ocular refraction vs. Spectacle refraction										
	TECHNIQUES										
5	MAGNIFICATION	4	CO5								
Referen	ce Books:										
1. M P	Keating: Geometric, Physic	cal and Visual optics, 2nd edition, Butterworth- Heinemann, USA, 2002.									
2. HL R	Rubin: Optics for clinicians, 2	2nd edition, Triad publishing company. Florida, 1974.									
3. H Ob	ostfeld: Optic in Vision- For	undations of visual optics & associated computations, 2nd edition, Butterworth, UK, 1982.									
4. WJ E	Benjamin: Borish's clinical	refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006.									
5. T Gr	osvenor: Primary Care Opto	metry,4th edition, Butterworth – Heineman, USA,2002.									
e-Lear	e-Learning Source:										
1 http	1 https://www.youtube.com/watch?v=ELPyMozXLOU										
2 http	2 https://www.youtube.com/watch?v=idQX7MBf3k8&list=PLfnnZvJNUsnogXdXVQNheEzPWGV1uHRqf										
3 http	os://www.youtube.com/wate	ch?v=dKaQB11I0z0									

					Co	ourse A	rticula	tion Ma	ntrix: (N	Mapping	of COs	with PO	s and PS	Os)			
PO-PSO	DO1	DOJ	DO2		DO5	DOG	DO7	DOS	DOO	<b>DO10</b>	DO11	DO12	DSO1	DSOJ	DSO3	DSO4	DSOS
СО	FOI	FO2	F05	r04	FUS	FU0	107	100	F09	FOID	FOIT	FO12	1301	F302	1303	F304	F305
CO1	1	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO2	1	3	2	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO3	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1
CO4	2	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO5	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title			Att	ributes				SDGs
BO214	VISUAL OPTICS- II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.
		1	1	1	4		1	1	3,4



Effective from Sessio	<b>n:</b> 2019-20						
Course Code	BO215	Title of the Course	CLINICAL EXAMINATION OF VISUAL SYSTEM - LAB	L	Т	Р	С
Year	II	Semester	IV	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
	At the end of	f the course the students w	vill be skilled in knowing the purpose, set- up and devices required fo	r the te	est, indi	cations	and
Course Objectives	contraindica	tions of the test, step-by	<i>i</i> - step procedures, documentation of the findings, and interpretation	on of t	the find	ings of	f the
	various clini	ical optometry procedures	S.				

	Course Outcomes
CO1	Understanding about the process of history taking and its clinical importance
CO2	Understanding about various clinical examination test available
CO3	Analyzing the importance of pupillary examination in the field of optometry
CO4	Applying all the theoretical knowledge on practical field
CO5	Understanding about the process of history taking and its clinical importance

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO						
1	VISUAL ACUITY	<ol> <li>Visual acuity estimation</li> <li>Extra ocular motility</li> </ol>	4	CO1						
2	CLINICAL PROCEDURES I	<ol> <li>Cover test, Alternating cover test</li> <li>Pupils Examination</li> <li>External examination of the eye, Lid Eversion</li> </ol>	4	CO2						
3	3       CLINICAL PROCEDURE II       6. Color Vision         7. Stereopsis       8. Photo stress test									
4	CLINICAL PROCEDURES III	9. Slit lamp bio microscopy	4	CO4						
5	CLINICAL PROCEDURES IV	10. Ophthalmoscopy 11. Tonometry	4	CO5						
Referen	ce Books:									
1.T Gros	svenor: Primary Care Optometry, 5th e	lition, Butterworth-Heineman, USA, 2007								
2.A K K	hurana: Comprehensive Ophthalmolo	bgy, 4th edition, new age international(p) Ltd. Publishers, New Delhi, 2007.								
3. B. Elli	3. B. Elliott: Clinical Procedures in Primary Eye Care, 3rd edition, Butterworth-Heinemann, 2007									
e-Learn	ing Source:									

1. https://www.youtube.com/watch?v=anpivljrat0

2. https://www.youtube.com/watch?v=WRIbtxk4Zto

3. https://www.youtube.com/watch?v=anpivljrat0

					Co	ourse A	rticula	tion Ma	atrix: (N	Apping	of COs	with PO:	s and PS	Os)			
PO-PSO	DO1	DO3	DO3		DO5	DOG	DO7	DOS	DOO	DO10	DO11	DO12	DSO1	DSOJ	DSO3	DSO4	DSO5
СО	FUI	FO2	FUS	r04	FUS	FOO	F07	100	F09	FOID	FOIT	FO12	1301	F302	1303	F304	1303
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

			Attilbu										
Course Code	Course Title		Attributes										
BO215	CLINICAL	Employability	Entrapropeurship	Skill	Gender	Environment &	Human	Professional	No.				
	EXAMINATION OF	Employability	Entrepreneursnip	Development	Equality	Sustainability	Value	Ethics					
	VISUAL SYSTEM - LAB	4	4	4	٧		4	٦	3,4				



Effective from Sessi	on: 2019	-20					
Course Code	BO216	Title of the Course	LOW VISION AID & OPTOMETRY INVESTIGATION- LAB	L	Т	P	С
Year	II	Semester	IV	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
	At the end	d of the course the students	s will be skilled in knowing the purpose, set- up and devices required for	the tes	st, inc	licati	ons
<b>Course Objectives</b>	and contr	aindications of the test, ste	p-by- step procedures, documentation of the findings, and interpretation of	of the f	indin	gs of	the
	various cl	inical optometry procedur	es				

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Understanding the basic definition and classification of Low Vision and Applying various optical and non-optical devices for visual
	rehabilitation of a low vision Patient.
CO2	Understanding how to do examination of a low vision Patient and the legal aspects of Low Vision in India, as well as applying case studies to
	for visual rehabilitation of a low vision Patient.
CO3	Understanding the concept of Visual Function, Visual Acuity, Color Vision, etc.
CO4	Applying Various Techniques for Diagnosis and Management of Various Eye Ailments.
CO5	Applying advance techniques for Evaluation of Cornea, Tear Film and Ocular Refraction.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	HISTORY TAKING	1. Attending in low vision care clinic and history taking.	4	CO1
2	TELESCOPES	2. Determining the type of telescope and its magnification (Direct comparison method & calculated method).	4	CO2
3	MAGNIFICATION	3. Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.	4	CO3
4	PRESCRIBING NORMS	4. Inducing visual impairment and prescribing magnification.	4	CO4
5	LOW VISION AIDS	<ol> <li>Determining reading speed with different types of low vision aids with same magnification</li> <li>Determining reading speed with a low vision aid of different magnifications</li> </ol>	4	CO5
Referen	ce Books:			
A K Khu	urana: Comprehensive Op	hthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007.		

D B. Elliott: Clinical Procedures in Primary Eye Care, 3rd edition, Butterworth- Heinemann, 2007.

Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth-Heinemann, 2007.

e-Learning Source:

1. https://www.youtube.com/watch?v=Sm6d4t873oI

2. https://www.youtube.com/watch?v=OmlKEGG5e-E

3. https://www.youtube.com/watch?v=TWmaZZDgPX0

		Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	DO1	DO3	DO3	DO4	DO5	DO6	<b>DO</b> 7	DOS	DO0	<b>DO10</b>	DO11	DO12	DSO1	DSO2	DSO2	DSO4	DSOS
CO	FUI	FO2	103	F04	F05	FOO	FO/	100	F09	F010	FOII	FO12	1301	F302	1303	F304	1303
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Course Code	Course Title		Attributes								
	LOW VISION AID &	Employability	Entrepreneurship	Skill	Gender	Environment &	Human	Professional	No.		
BO216	OPTOMETRY	Employaolity	Lincepteneursnip	Development	Equality	Sustainability	Value	Ethics			
	INVESTIGATION- LAB	4	4	1	1		1	4	3,4		



Effective from Session: 2019-20											
Course Code	BO217	Title of the Course	HOSPITAL POSTING- LAB	L	Т	Р	С				
Year	II	Semester	IV	0	0	6	3				
<b>Pre-Requisite</b>	Nil	Nil Co-requisite Nil									
Course Objectives	At the end of the co contraindications of clinical optometry p	urse the students will be sl f the test, step-by- step pro procedures	killed in knowing the purpose, set- up and devices required for occedures, documentation of the findings, and interpretation of the	the te le find	st, indic ings of	cations the vari	and ious				

	Course Outcomes: After the successful course completion, learners will develop following attributes:
CO1	Analyzing the concept of clinical features of the diseases for the managementof ocular diseases
CO2	Understanding about accommodation, its anomalies and their practical significance
CO3	Applying Various Techniques for Diagnosis and Management of Various Eye Ailments.
CO4	Applying advance techniques for Evaluation of Cornea, Tear Film and Ocular Refraction.
CO5	Applying of different pharmaceutical agents in the management of Oculardisease as well as managing Ocular Toxicity.

Unit No	Title of the		Conte	ent of Unit	Contact Hrs	Mapped
110.	Unit	Students will improve the	r skills in clinical proc	edures and then progressive interactions with patients	шь.	CO
		and professional personal	are monitored as studen	its practice optometry in supervised setting. Additional		
		area includes problem sol	ving and complications	of various managements will be inculcated. Students		
		should have exposure to exposu	ve bank facilities and m	ust be made aware of eve donation, collection of eves.		
		preservation pre and post	operative instructions a	nd latest techniques for preservation of donor cornea		
		The students will get clinic	al training on the practi	cal aspects of the following courses namely optometric		
		optic –II & dispensing opti	cs visual optics – II and	d ocular disease -II		
		History taking		Can practice on the following complaint:		
		1.General 2. Specific	30 cases	Blurred Vision, Headache, Pain, redness,		
		3.Conditions		Watering, Flashes, Floaters, Blacks pots		
		Lensometry	100 ansas	Simple Sphere, Simple cylinder, Sphero cylinder (90, 180		
			100 cases	Oblique degrees), Bifocals, PAL		
		Visual Acuity Pinhole acuity	100 cases	Simulation, especially to show and ask the students to		
			100 00000	interpret the findings.		<b>G</b> Q 4
		Extra ocular Motility	10 cases			COI,
	Clinical	Cover test	10 cases	Video output Simulation of various conditions.	<i>c</i> 0	CO2,
1	training	Alternate Cover test	10 cases	video output Simulation of various conditions.	60	CO3, CO4,
		Hirschberg test	10 cases	Video output Simulation of various conditions.		
		Modified Krimsky test	3 cases Video output Simulation of various conditions.			C05
		Push up test (Amplitude of	10 cases			
		Accommodation)	(1 case in presbyopia age)			
		Push up test (Near point of	10			
		Convergence)	10 cases			
		Stereopsis test	10 cases			
		Amalan'a Crid taat	10 cases	Simulation of various conditions		
		Amster's Grid test	10 cases (simulate)	Simulation of various conditions		
		Color vision test				
		Schirmer's test	10 cases			
		Confrontation test	10 cases			
		Torch light Examination	50 cases			
		Slit lamp examination	10 cases			
		Digital tonometry	10 cases			
Refe	rence Books:				•	
1.A K	Khurana: Compre	hensive Ophthalmology, 4th	edition, new age intern	ational(p) Ltd. Publishers, New Delhi, 2007.		
2. B. I	Elliott: Clinical Proce	dures in Primary Eye Care,3	rd edition, Butterworth-	Heinemann, 2007		
3. Jac	k J. Kanski Clinica	l Ophthalmology: A System	atic Approach, 6th editi	on, Butterworth- Heinemann, 2007.		
e-L	earning Source:	••••••				
1. h	ttps://www.youtube.c	com/watch?v=Sm6d4t873oI				

2. https://www.youtube.com/watch?v=OmlKEGG5e-E

3. https://www.youtube.com/watch?v=TWmaZZDgPX0

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO-PSO	DO1	DOJ	DO3	DO4	DO5	DO6	DO7	DOS	DO0	DO10	DO11	DO12	DSO1	DSO2	DSO2	DSO4	DSO5
СО	FOI	FO2	F03	F04	F03	FO0	F07	100	F09	F010	FOII	F012	1301	F302	1303	1304	1303
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

Course Code	Course Title		Attributes								
BO217	HOSPITAL POSTING- LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	No.		
		4	4	√	1		1	1	3,4		