Program and Course Structure

School of Allied Health Sciences

Bachelor of Optometry
Program code: SAH0121
(2020-2024)

1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

Core Values

- Integrity
- Leadership
- Diversity
- Community

1.2 Vision and Mission of the School

Vision, Mission and Core Values of the School of Allied Health Sciences

Vision of the School

To steer the School of Allied Health Sciences towards excellence in academics, innovation and entrepreneurship by constant endeavors

Mission of the School

1. To create the state of the art facility for quality teaching learning, research & innovation
2. To incorporate the contemporary standards in teaching & learning
3. To inculcate in the students values of integrity and compassion towards the care of patients and society.

Core Values

- Critical Thinking and Observation
- Analytical Skills
- Creativity
- Skilled professional
- Multidimensional
- Compassion

1.3 Programme Educational Objectives (PEO) of B.Optometry

PEO1 : Apply the knowledge in basic allied and health sciences, general and ocular medical sciences, visual sciences, clinical sciences, as well as an understanding of the health care delivery system.

PEO2 : Provide quality eye and vision care through comprehensive and appropriate examination, measurement, assessment, diagnosis, treatment, and management of eye and vision conditions

PEO3 : Demonstrate competence in the prevention, detection, diagnosis, and management of visual conditions and processes caused by systemic disease

PEO4 : Exhibit standard personal, professional, and ethical values fitting of a health care provider

PEO5 : Direct and exhibit research and clinical studies which will contribute to the advancement of optometry and improve the quality of life

1.3.2 Map PEOs with Mission Statements:

PEO Statements	School Mission 1	School Mission 2
PEO1:	3	2
PEO2:	2	3
PEO3:	3	3
PEO4:	2	1
PEO5:	3	2

1.3.3 Program Outcomes (PO's)

PO1 : Apply the knowledge of general and ocular medical sciences, visual sciences, clinical sciences, as well as an understanding of health care delivery system.

PO2 : Find, analyze, evaluate and apply the information systematically and shall make a appropriate diagnosis to provide quality eye and vision care.

PO3 : Demonstrate effective planning abilities including the prevention, detection, diagnosis, and management of visual conditions.

PO4 : Apply ethical principles and commit to professional ethics and responsibilities and norms of the optometry practice.

PO5 : Conduct and present research and clinical studies which will contribute to the advancement of optometry and health sciences.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	3	2	2	1	2
PO2	2	3	2	1	2
PO3	2	2	3	1	2
PO4	1	1	1	3	1
PO5	2	2	2	1	3

1.3.5 BOPT Program Outcome Vs Courses Mapping Table[1]:

Program Outcome Courses	Course code	Course Name		PO1	PO2	PO3	PO4	PO5
Semester-1								
Theory								
Course 1.1	BOP105	General Anatomy	CO1	3	3	3	3	3
			CO2	3	2	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.2	BOP106	General Physiology	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	2	3	3
			CO4	3	3	3	3	3
Course 1.3	BOP107	Basic Biochemistry – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	2	3	3	2
			CO4	3	3	3	3	3
Course 1.4	BOP108	Physical Optics	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.5	BOP109	Geometrical Optics-I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.6	BOP104	English and Communication-I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Practical								
Course 1.7	BOP 001	Optometric Procedures – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3

[1] Cel value will contain the correlation value of respective course with PO.

Course 1.8	BOP 155	General Anatomy(LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.9	BOP 156	General Physiology(LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.10	BOP 157	Basic Biochemistry – I(LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 1.11	BOP 158	Physical Optics(LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Semester 2								
Theory								
Course 2.1	BOP110	Basic Biochemistry – II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.2	BOP111	Ocular Anatomy	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	2	3	3
Course 2.3	BOP112	Ocular Physiology	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.4	BOP113	Geometrical Optics – II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.5	BOP114	Nutrition	CO1	3	3	3	3	3
			CO2	3	3	2	3	3

			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Practical								
Course 2.6	BOP002	Clinical Optometry-II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.7	BOP159	Basic Biochemistry – II(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.8	BOP160	Ocular Anatomy(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.9	BOP161	Ocular Physiology(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 2.10	BOP162	Geometrical Optics – II(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Semester 3								
Theory								
Course 3.1	BOP206	Applied Optics – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.2	BOP207	Visual Optics – I (Visual Perception & Neurophysiology)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.3	BOP208	Ocular Diseases – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3

Course 3.4	BOP209	Microbiology	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.5	BOP210	Pathology	CO1	3	3	2	3	3
			CO2	3	3	3	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	2
Course 3.6	BOP 205	English and Communication-II	CO1	3	3	2	3	3
			CO2	3	3	3	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	2
Practical								
Course 3.7	BOP003	Clinical Optometry-I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.8	BOP255	Applied Optics – I(LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.9	BOP256	Visual Optics – I (Visual Perception & Neurophysiology) (LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 3.10	BOP257	Ocular Diseases – I (LAB)	CO1	3	3	2	3	3
			CO2	3	3	3	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	2
Course 3.11	BOP258	Microbiology (LAB)	CO1	3	3	2	3	3
			CO2	3	3	3	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	2
Semester 4								
Theory								
Course 4.1	BOP211	Applied Optics – II	CO1	3	3	3	3	3

			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.2	BOP212	Visual Optics- II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.3	BOP213	Basic Pharmacology	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.4	BOP214	Optometric Instruments	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.5	BOP215	Ocular Diseases- II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Practical								
Course 4.6	BOP004	Clinics- II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.7	BOP259	Applied Optics – II(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.8	BOP260	Visual Optics- II (Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.9	BOP261	Basic Pharmacology(Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 4.10	BOP262	Optometric Instruments (Lab)	CO1	3	3	3	3	3

			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Semester 5								
Theory								
Course 5.1	BOP310	Contact Lens – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.2	BOP311	Low Vision & Rehabilitation	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.3	BOP312	Public Health, Community & Occupational Optometry	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.4	BOP313	Binocular Vision – I	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.5	BOP314	Diseases of the Eye and Clinical Medicine	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Practical								
Course 5.6	BOP005	Clinics-IV	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.7	BOP355	Contact Lens – I (LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.8	BOP356	Low Vision & Rehabilitation (LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3

			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 5.9	BOP357	Binocular Vision – I (LAB)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Semester 6								
Theory								
Course 6.1	BOP315	Contact Lens – II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.2	BOP316	Binocular Vision – II	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.3	BOP317	Geriatric Optometry	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.4	BOP318	Pediatric Optometry	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.5	BOP319	Dispensing Optometry	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Practical								
Course 6.6	BOP006	Clinic – IV	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.7	BOP358	Contact Lens – II (Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3

Course 6.8	BOP359	Binocular Vision – II (Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.9	BOP360	Pediatric Optometry (Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3
Course 6.10	BOP361	Dispensing Optometry (Lab)	CO1	3	3	3	3	3
			CO2	3	3	2	3	3
			CO3	3	3	3	3	3
			CO4	3	3	3	3	3

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2020-2024
TERM: I

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[2]: 1. CC 2. AECC 3. SEC 4. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35021	BOP 105	General Anatomy	3	1	-	4	Core	CC
2.	35022	BOP 106	General Physiology	3	1	-	4	Core	CC
3.	35023	BOP 107	Basic Biochemistry – I	2	1	-	3	Core	CC
4.	35024	BOP 108	Physical Optics	2	1	-	3	Core	CC,AECC
5.	35025	BOP 109	Geometrical Optics-I	4	1	-	5	Core	CC,AECC
6.	35464	BOP104	English and Communication-I	1	-	-	1	Co-Requisite	SEC
Practical/Viva-Voce/Jury									
7.	35026	BOP 001	Optometric Procedures – I	-	-	4	2	Co-Requisite	SEC
8.	35027	BOP 155	General Anatomy(LAB)	-	-	2	1	Core	CC,SEC
9.	35028	BOP 156	General Physiology(LAB)	-	-	2	1	Core	CC,SEC
10.	35029	BOP 157	Basic Biochemistry – I(LAB)	-	-	2	1	Core	CC,SEC
11.	35030	BOP 158	Physical Optics(LAB)	-	-	2	1	Core	CC,SEC
TOTAL CREDITS							**26**		

[2] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2020-2024
TERM: II

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[3]: 5. CC 6. AECC 7. SEC 8. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35075	BOP110	Basic Biochemistry – II	2	1	-	3	Core	CC
2.	35076	BOP111	Ocular Anatomy	3	1	-	4	Core	CC
3.	35077	BOP112	Ocular Physiology	3	1	-	4	Core	CC
4.	35078	BOP113	Geometrical Optics – II	3	1	-	4	Core	CC,AECC
5.	35079	BOP114	Nutrition	2	-	-	2	Core	CC
Practical/Viva-Voce/Jury									
6.	35080	BOP002	Clinical Optometry- II	-	-	4	2	Co-Requisite	SEC
7.	35081	BOP159	Basic Biochemistry – II(Lab)	-	-	2	1	Core	CC,SEC
8.	35082	BOP160	Ocular Anatomy(Lab)	-	-	2	1	Core	CC,SEC
9.	35083	BOP161	Ocular Physiology(Lab)	-	-	2	1	Core	CC,SEC
10.	35084	BOP162	Geometrical Optics – II(Lab)	-	-	2	1	Core	CC,SEC
TOTAL CREDITS							23		

[3] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2020-2024
TERM: III

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course4: 9. CC 10. AECC 11. SEC 12. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35102	BOP206	Applied Optics – I	3	1	-	4	Core	CC,AECC
2.	35103	BOP207	Visual Optics – I (Visual Perception & Neurophysiology)	3	1	-	4	Core	CC,AECC
3.	35104	BOP208	Ocular Diseases – I	3	1	-	4	Core	CC,AECC
4.	35105	BOP209	Microbiology	2	-	-	2	Core	CC
5.	35106	BOP210	Pathology	2	-	-	2	Core	CC
6.	35465	BOP205	English and Communication-II	1	-	-	1	Co-Requisite	SEC
Practical/Viva-Voce/Jury									
7.	35107	BOP003	Clinical Optometry-I	-	-	8	4	Co-Requisite	SEC
8.	35108	BOP255	Applied Optics – I(LAB)	-	-	2	1	Core	CC,SEC
9.	35109	BOP256	Visual Optics – I (Visual Perception & Neurophysiology) (LAB)	-	-	2	1	Core	CC,SEC
10.	35110	BOP257	Ocular Diseases – I (LAB)	-	-	2	1	Core	CC,SEC
11.	35111	BOP258	Microbiology (LAB)	-	-	2	1	Core	CC,SEC

[4] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

TOTAL CREDITS	25		

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2017-2020
TERM: IV

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course5: 13. CC 14. AECC 15. SEC 16. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35179	BOP211	Applied Optics – II	3	1	-	4	Core	CC,AECC
2.	35180	BOP212	Visual Optics- II	3	1	-	4	Core	CC,AECC
3.	35181	BOP213	Basic Pharmacology	2	-	-	2	Core	CC
4.	35182	BOP214	Optometric Instruments	2	-	-	2	Core	CC,AECC
5.	35183	BOP215	Ocular Diseases- II	3	1	-	4	Core	CC,AECC
Practical/Viva-Voce/Jury									
6.	35184	BOP004	Clinics- II	-	-	4	2	Co-Requisite	SEC
7.	35185	BOP259	Applied Optics – II(Lab)	-	-	2	1	Core	CC,SEC
8.	35186	BOP260	Visual Optics- II (Lab)	-	-	2	1	Core	CC,SEC
9.	35187	BOP261	Basic Pharmacology (Lab)	-	-	2	1	Core	CC,SEC
10.	35188	BOP262	Optometric Instruments (Lab)	-	-	3	1	Core	CC,SEC

[5] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

TOTAL CREDITS	22		

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2017-2020
TERM: V

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course6: 17. CC 18. AECC 19. SEC 20. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35241	BOP310	Contact Lens – I	3	1	-	4	Core	CC,AECC
2.	35242	BOP311	Low Vision & Rehabilitation	3	1	-	4	Core	CC,AECC
3.	35243	BOP312	Public Health, Community & Occupational Optometry	2	-	-	2	Core	CC
4.	35244	BOP313	Binocular Vision – I	3	1	-	4	Core	CC,AECC
5.	35245	BOP314	Diseases of the Eye and Clinical Medicine	2	-	-	2	Core	CC
Practical/Viva-Voce/Jury									
6.	35246	BOP005	Clinics-IV	-	-	4	2	Core	CC,SEC
7.	35247	BOP355	Contact Lens – I (LAB)	-	-	2	1	Core	CC,SEC
8.	35248	BOP356	Low Vision & Rehabilitation (LAB)	-	-	2	1	Core	CC,SEC
9.	35249	BOP357	Binocular Vision – I (LAB)	-	-	2	1	Core	CC,SEC
TOTAL CREDITS							**21**		

[6] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2017-2020
TERM: VI

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course7: 21. CC 22. AECC 23. SEC 24. DSE
				L	T	P			
THEORY SUBJECTS									
1.	35321	BOP315	Contact Lens – II	3	1	-	4	Core	CC,AECC
2.	35322	BOP316	Binocular Vision – II	3	1	-	4	Core	CC,AECC
3.	35323	BOP317	Geriatric Optometry	2	-	-	2	Core	CC,AECC
4.	35324	BOP318	Pediatric Optometry	2	-	-	2	Core	CC,AECC
5.	35325	BOP319	Dispensing Optometry	2	1	-	3	Core	CC,AECC
Practical/Viva-Voce/Jury									
6.	35326	BOP006	Clinic – IV	-	-	4	2	Core	CC,SEC
7.	35327	BOP358	Contact Lens – II (Lab)	-	-	2	1	Core	CC,SEC
8.	35328	BOP359	Binocular Vision – II (Lab)	-	-	2	1	Core	CC,SEC
9.	35329	BOP360	Pediatric Optometry (Lab)	-	-	2	1	Core	CC,SEC
10.	35330	BOP361	Dispensing Optometry (Lab)	-	-	2	1	Core	CC,SEC

[7] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

TOTAL CREDITS	21		

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2017-2020
TERM: VII

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[8]: 1. CC 2. AECC 3. SEC 4. DSE
				L	T	P			
THEORY SUBJECTS									
1.		BOP007	Clinics –Comprehensive eye exam	-	1	4	3	Core	CC,SEC
2.		BOP008	Clinics – Pediatric and binocular vision	-	1	4	3	Core	CC,SEC
3.		BOP009	Clinics –Retina, glaucoma and low vision	-	1	4	3	Core	CC,SEC
4.		BOP010	clinics – Applied optics	-	1	4	3	Core	CC,SEC
5.		BOP011	Clinics – Cornea and contact lenses	-	1	4	3	Core	CC,SEC
6.		BOP012	Clinical Project / Public Health Project	-	3	4	5	Core	CC,SEC
TOTAL CREDITS							**20**		

[8] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Program Structure
Allied Health Sciences
Bachelor of optometry
Batch: 2017-2020
TERM: VIII

S. No.	Paper ID	Subject Code	Subjects	Teaching Load			Credits	Core/Elective Pre-Requisite/ Co Requisite	Type of Course[9]: 1. CC 2. AECC 3. SEC 4. DSE
				L	T	P			
THEORY SUBJECTS									
1.		BOP013	Clinics –Comprehensive eye exam	-	1	4	3	Core	CC,SEC
2.		BOP014	clinics – Pediatric and binocular vision	-	1	4	3	Core	CC,SEC
3.		BOP015	Clinics –Retina, glaucoma and low vision	-	1	4	3	Core	CC,SEC
4.		BOP016	Clinics – Applied optics	-	1	4	3	Core	CC,SEC
5.		BOP017	Clinics – Cornea and contact lenses	-	1	4	3	Core	CC,SEC
6.		BOP018	Clinical Project / Public Health Project	-	3	4	5	Core	CC,SEC
TOTAL CREDITS							**20**		

[9] CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

Course Structure

Syllabus for Bachelor of Optometry

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP105	
2	Course Title	General Anatomy	
3	Credits	4	
4	Contact Hours (L-T)	3-1	
	Course Type	Compulsory	
5	Course Objective	1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body. 2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions. 3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising the anatomical structure of the human body. CO2:**Comprehension:** understanding, characterising, explaining, identifying and locating the anatomical structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general anatomy in better understanding the relevance to human eye. CO4: **Analysis:** analysing, categorising, comparing and differentiating the anatomical structure of the human body.	
7	Course Description	General anatomy deals with the entire human anatomy with emphasis on different tissues, blood vessels, glands, nerves and the entire central nervous system in particular.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Anatomical terms organization of the human body**	
	A	Human Cell structure; Tissues -Definition, Types, characteristics, classification, location, functions and formation	CO1, CO2
	B	Membranes and glands - classification and structure	CO3,CO4
	C	Applied anatomy	CO1,CO2
	Unit 2	**The Skeletal System and The Muscular System**	
	A	Bones- types, structure, Axial & Appendicular Skeleton, Description of bones; Joints - classification and structure	CO2,CO4
	B	Types and structure of muscles; Muscle groups	CO1, CO3
	C	Applied anatomy	CO1,CO3
	Unit 3	**The Nervous System**	
	A	Structure of neurons and neuroglial cells; Divisions of nervous system	CO2,CO4

	B	Structure of brain, spinal cord, cranial nerves, spinal nerves, peripheral nerves ;Autonomic Nervous System — sympathetic, parasympathetic			CO1,CO3
	C	Applied anatomy			CO1,CO2
	Unit 4	**THORAX**			
	A	**The Circulatory System:** Structure of Heart; Structure of blood vessels — Arterial & Venous System, Circulation: systemic, pulmonary, coronary			CO2
	B	**Lymphatic system:** Lymphatic vessels and lymph, Lymphatic tissues, Thymus gland, Lymph nodes, Spleen, Lymphatic nodules, Applied anatomy			CO4
	C	**The Respiratory System:** Structure of the organs of respiration, Applied anatomy			CO1,CO3
	Unit 5	**ABDOMEN AND PELVIS**			
	A	**The Digestive System:** Structure of Alimentary tract and accessory organs of digestion**,** Applied anatomy			CO1,CO3
	B	**The Reproductive system:** Structure of female reproductive organs; Structure of male reproductive organs, Applied anatomy			CO2
	C	**The Excretory System (Urinary):** Structure of organs of urinary; System: Kidney, ureters, urinary bladder, urethra, structure of skin; Applied anatomy			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Human Anatomy by Japee brothers			
	Other References	Anatomy and Physiology of human body			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 1st**
1	Course Code	BOP155
2	Course Title	General Anatomy (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body. 2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions. 3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising the anatomical structure of the human body. CO2:**Comprehension:** understanding, characterising, explaining,

		identifying and locating the anatomical structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general anatomy in better understanding the relevance to human eye. CO4: **Analysis:** analysing, categorising, comparing and differentiating the anatomical structure of the human body.	
7	Course Description	General anatomy deals with the entire human anatomy with emphasis on different tissues, blood vessels, glands, nerves and the entire central nervous system in particular.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Anatomical terms organization of the human body**	
	A	Practical demonstration of cell using specimen or video	CO1, CO2
	B	Practical demonstration of tissue using specimen or video	CO3,CO4
	C	Practical demonstration of glands using specimen or video	CO1,CO2
	Unit 2	**The Skeletal System and The Muscular System**	
	A	Practical demonstration of bones using specimen or video	CO2,CO4
	B	Practical demonstration of joints using specimen or video	CO1, CO3
	C	Practical demonstration of muscles using specimen or video	CO1,CO3
	Unit 3	**The Nervous System**	
	A	Practical demonstration of neurons and neuroglial cells	CO2,CO4
	B	Practical demonstration of brain, spinal cord, cranial nerves, spinal nerves, peripheral nerves	CO1,CO3
	C	Practical demonstration of Autonomic Nervous System	CO1,CO2
	Unit 4	**THORAX**	
	A	Practical demonstration of circulatory system using specimen or video	CO2
	B	Practical demonstration of lymphatic system using specimen or video	CO4
	C	Practical demonstration of respiratory system using specimen or video	CO1,CO3
	Unit 5	**ABDOMEN AND PELVIS**	
	A	Practical demonstration of digestive system using specimen or video	CO1,CO3
	B	Practical demonstration of reproductive system using specimen or video	CO2
	C	Practical demonstration of excretory system using specimen or video	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA / ETE	
		60% / 40%	
	Text book/s*	Human Anatomy by Japee brothers	
	Other References	Anatomy and Physiology of human body	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch:Optometry		**Semester: 1st**	
1	Course Code	BOP106	
2	Course Title	General Physiology	
3	Credits	4	
4	Contact Hours (L-T)	3-1	
	Course Type	Compulsory	
5	Course Objective	1. Understanding, characterizing, explaining, identifying and locating physiology of the human body. 2. Identifying and locating the physiological structure of the human body	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the physiological structure of the human body CO2: **Comprehension:** understanding, characterizing, explaining, identifying and locating the physiological structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general physiology in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the physiological structure of the human body.	
7	Course Description	The course in Physiology cover the first year is designed to give the students indepth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.	
8	Outline syllabus		CO Mapping
	Unit 1	**General physiology ,Blood & CVS**	
	A	Functions of cell organelles, transport across cell membrane, body fluids ,homeostasis & membrane potential, difference between skeletal, smooth & cardiac muscle	CO1, CO2
	B	Composition & functions of blood, plasma proteins, Hemoglobin, RBC, WBC & Platelets, Blood Clotting, Blood groups & related applied.	CO3,CO4
	C	Physiological anatomy and functions of the heart & blood vessels, Cardiac Cycle, Conducting system of heart, Heart sounds & ECG, Blood Pressure & Pulse.	CO1,CO2
	Unit 2	**Respiratory system & Excretory system**	
	A	Physiological anatomy & functions of respiratory system, Mechanism of breathing , graph of lung volume & capacities, Transport of gases , disorders of respiratory system	CO2,CO4
	B	Physiological anatomy, structure and functions of excretory system, structure of nephron, formation of	CO1, CO3

		Urine & Micturition			
	C	Hypoxia & temperature regulation			CO1,CO3
	Unit 3	**Digestive System**			
	A	Physiological anatomy and functions of GIT, deglutition			CO2,CO4
	B	Composition and Functions of Gastric juices ,(saliva, gastric Juice , Bile , Pancreatic juice & Succus Entericus)			CO1,CO3
	C	Peristalsis, Digestion and Absorption in GIT			CO1,CO2
	Unit 4	**Endocrines and Reproductive system**			
	A	General principles of endocrinology, Hormones secreted, functions and applied of Pituitary Gland, Thyroid Gland, Parathyroid gland, Adrenal Cortex & Pancreas			CO2
	B	Puberty, Male and Female reproductive Hormones, Spermatogenesis, Ovulation & Menstrual cycle			CO4
	C	Contraceptive measures			CO1,CO3
	Unit 5	**The Nervous System & Special Senses**			
	A	Structure , functions &classification of nerve tissues, NMJ			CO1,CO3
	B	Oganization of Nervous system, The Synapse , Physiology of receptor organs for special and general sensation, physiology of reflex Arc, Functions of hypothalamus, thalamus, basal ganglia, cerebrum & cerebellum .Autonomic nervous system, Cerebrospinal Fluid and Blood Brain Barrier			CO2
	C	Taste, Smell, Eye & Ear –structure , functions and applied			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Human Physiology by Jaypee brothers			
	Other References	Anatomy and Physiology of human body			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 1st**
1	Course Code	BOP156
2	Course Title	General Physiology (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	1. Understanding, characterizing, explaining, identifying and locating physiology of the human body. 2.Identifying and locating the physiological structure of the human body

6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the physiological structure of the human body CO2: **Comprehension:** understanding, characterizing, explaining, identifying and locating the physiological structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general physiology in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the physiological structure of the human body.		
7	Course Description	The course in Physiology cover the first year is designed to give the students in-depth knowledge of fundamental functions of different systems of human body. The major topics to be covered include the following: the cell, muscle& nervous tissue; blood; lymphoid tissues; respiratory system; blood vessels; circulation; heart; gastro intestinal tract; endocrine & Reproductive system, excretory system, central nervous system and special senses.		
8	Outline syllabus			CO Mapping
	Unit 1			
	A	Study of Compound Microscope		CO1, CO2
	B			CO3,CO4
	C			CO1,CO2
	Unit 2			
	A	Estimation of Haemoglobin Concentration		CO2,CO4
	B	BT,CT		CO1, CO3
	C	Blood groups		CO1,CO3
	Unit 3			
	A	Total Red Blood Cell Count		CO2,CO4, CO1
	B			
	C	Total Leucocytes count		CO1,CO2, CO3
	Unit 4			
	A	Differential Leucocyte Count.		CO2, CO4 CO1,CO3
	B			
	C			
	Unit 5			
	A	Arterial Blood Pressure		CO1,CO3
	B	Radial pulse		CO2,CO4
	C			
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	Human Physiology by Jaypee brothers		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP107	
2	Course Title	Basic Biochemistry-I	
3	Credits	3	
4	Contact Hours (L-T)	2-1	
	Course Type	Compulsory	
5	Course Objective	Understanding, characterising, explaining, identifying and locating the biochemical present, analysing, categorising, comparing and differentiating the biochemical present in the human body.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the biochemical of the human body. CO2:understanding, characterising, explaining, identifying and locating the biochemical present in the human body. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to human eye. CO4:analysing, categorising, comparing and differentiating the biochemical present in the human body.	
7	Course Description	This course is being taught in two consecutive semesters. Basic Biochemistry-I deals with the biochemical nature of carbohydrates, proteins, minerals, vitamins, lipids, etc. A detailed study of this, emphasizing on their chemical compositions and their role in metabolism is the required aim of this course.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction of Biochemistry and Sampling techniques**	
	A	Introduction of Biochemistry including laboratory glasswares and equipments.	CO1, CO2
	B	Safety of measurements in Laboratory	CO3,CO4
	C	Sampling technique and preparation of reagents	CO1,CO2
	Unit 2	**Acid Base balance and Nutrition**	
	A	Acid-Base balance, pH	CO2,CO4
	B	Buffer system of body	CO1, CO3
	C	Nutrition	CO1,CO3
	Unit 3	**Carbohydrates chemistry and metabolism**	
	A	Carbohydrate chemistry	CO2,CO4
	B	Digestion and absorption of Carbohydrates	CO1,CO3
	C	Metabolism of Carbohydrates	CO1,CO2
	Unit 4	**Lipids chemistry and metabolism**	

	A	Lipids chemistry			CO2
	B	Digestion and absorption of Lipids			CO4
	C	Metabolism of Lipids			CO1,CO3
	Unit 5	**Biological oxidation**			
	A	Electron transport chain			CO2
	B	Oxidative phosphorylation & Uncouplers			CO4
	C	Free radicals chemistry and antioxidant defense system			CO1,CO3
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	**Text Book of Medical Biochemistry**			
	Other References	S. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications , 1992			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP157	
2	Course Title	Basic Biochemistry-I (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	Understanding, characterising, explaining, identifying and locating the biochemical present, analysing, categorising, comparing and differentiating the biochemical present in the human body.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the biochemical of the human body. CO2:understanding, characterising, explaining, identifying and locating the biochemical present in the human body. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to human eye. CO4:analysing, categorising, comparing and differentiating the biochemical present in the human body.	
7	Course Description	This course is being taught in two consecutive semesters. Basic Biochemistry-I deals with the biochemical nature of carbohydrates, proteins, minerals, vitamins, lipids, etc. A detailed study of this, emphasizing on their chemical compositions and their role in metabolism is the required aim of this course.	
8	Outline syllabus		CO Mapping

	Unit 1	**Introduction to Laboratory apparatus**		
	A	Introduction to Laboratory apparatus -1		CO1, CO2
	B	Introduction to Laboratory apparatus -2		CO3,CO4
	C	Introduction to Laboratory apparatus -3		CO1,CO2
	Unit 2	**Introduction to Laboratory glasswares**		
	A	Introduction to Laboratory glasswares -1		CO2,CO4
	B	Introduction to Laboratory glasswares -2		CO1, CO3
	C	Introduction to Laboratory glasswares -3		CO1,CO3
	Unit 3	**Safety measures and Lab protocols**		
	A	Safety measurements in Biochemistry lab		CO2,CO4
	B	Protocols General laboratory		CO1,CO3
	C	Awareness in a lab		CO1,CO2
	Unit 4	**Preparation of acid and bases of different concentrations**		
	A	Preparation of acids of different concentration		CO2
	B	Preparation of bases of different concentration		CO4
	C	Preparation of solutions of different concentration		CO1,CO3
	Unit 5	**Titration**		
	A	Determination of the strength of NaOH solution		CO1,CO3
	B	Determination of the strength of HCl solution		CO2
	C	Determination of the strength of NH_4OH solution		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	**Text Book of Medical Biochemistry**		
	Other References	S. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications , 1992		

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 1st**
1	Course Code	BOP108
2	Course Title	Physical Optics
3	Credits	3
4	Contact Hours (L-T)	2-1
	Course Type	Compulsory
5	Course	The completion of this course will help in thorough knowledge of

	Objective	properties of light At the end of this course, students will be able to predict the distribution of light under various conditions.	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	Physical Optics is the study of light, its properties and its interaction with matter. Specifically, the phenomena of interference, diffraction, polarization and scattering will be dealt with in details.	
8	Outline syllabus		CO Mapping
	Unit 1	**Nature of light**	
	A	Light as electromagnetic oscillation – wave equation; ideas of sinusoidal oscillations – simple harmonic oscillation; transverse nature of oscillation; concepts of frequency, wavelength, amplitude and phase Sources of light; Electromagnetic Spectrum.	CO1, CO2
	B	Polarized light; linearly polarized light; and circularly polarized light.	CO3,CO4
	C	Intensity of polarized light; Malus' Law; polarizers and analyzers; Methods of producing polarized light; Brewster's angle.	CO1,CO2
	Unit 2		
	A	Birefringence; ordinary and extraordinary rays and relationship between amplitude and intensity.	CO2,CO4
	B	Coherence; interference; constructive interference, destructive interference; fringes; fringe width. Double slits, multiple slits, gratings.	CO1, CO3
	C	Diffraction; diffraction by a circular aperture; Airy's disc	CO1,CO3
	Unit 3		
	A	Resolution of an instrument (telescope, for example); Raleigh's criterion Scattering; Raleigh's scattering;	CO2,CO4
	B	Tyndall effect.	CO1,CO3
	C	Fluorescence and Phosphorescence	CO1,CO2
	Unit 4	**Basics of Lasers**	
	A	Coherence; population inversion	CO2
	B	Spontaneous emission	CO4
	C	Einstein's theory of lasers.	CO1,CO3
	Unit 5	**Units of light measurement**	
	A	Radiometry; solid angle; radiometric units; photopic and scotopic luminous efficiency and efficacy curves; photometric units	CO1,CO3

	B	Inverse square law of photometry; Lambert's law.			CO2
	C	Other units of light measurement; retinal illumination; Trolands			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Subrahmanyan N, BrijLal, *A text book of Optics*, S. Chand Co Ltd, New Delhi, India, 2003.			
	Other References	▪ Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998. ▪ Keating NM. P, *Geometric, Physical and Visual Optics*, Butterworth- Heinemann, Massachusetts, USA, 2002.			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP158	
2	Course Title	Physical Optics (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	The completion of this course will help in thorough knowledge of properties of light At the end of this course, students will be able to predict the distribution of light under various conditions.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	Physical Optics is the study of light, its properties and its interaction with matter. Specifically, the phenomena of interference, diffraction, polarization and scattering will be dealt with in details.	
8	Outline syllabus		CO Mapping

	Unit 1		
	A	Gratings	CO1, CO2
	B	Determination of grating constant using Sodium vapour lamp	CO3,CO4
	C	Determination of wavelengths of light from Mercury vapour lamp	CO1,CO2
	Unit 2		
	A	Circular Apertures	CO2,CO4,CO1
	B	Measurements of Airy's disc for apertures of various sizes	CO1, CO3
	C		
	Unit 3		
	A	Verification of Malus' Law using a polarizer – analyzer combination	CO2,CO4
	B	Demonstration of birefringence using Calcite crystals	CO1,CO3
	C	Measurement of the resolving power of telescopes.	CO1,CO2
	Unit 4		
	A	Newton's rings	CO2
	B	Demonstration of fluorescence and phosphorescence using crystals and paints	CO4, CO1,CO3
	C		
	Unit 5		
	A	Demonstration of Tyndall Effect	CO1,CO3
	B	Einstein's theory of lasers.	CO2, CO4
	C		
	Mode of examination	Practical	
	Weightage Distribution	CA / ETE	
		60% / 40%	
	Text book/s*	Subrahmanyan N, BrijLal, *A text book of Optics*, S. Chand Co Ltd, New Delhi, India, 2003.	
	Other References	▪ Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998. ▪ Keating NM. P, *Geometric, Physical and Visual Optics*, Butterworth- Heinemann, Massachusetts, USA, 2002.	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 1st**
1	Course Code	BOP109
2	Course Title	Geometrical Optics-I
3	Credits	5

4	Contact Hours (L-T)	4-1	
	Course Type	Compulsory	
5	Course Objective	At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye. Also to equip the students with a thorough knowledge of mirrors and lenses.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	Geometric Optics is the study of light and its behavior as it propagates in a variety of media. Specifically, the phenomena of reflection and refraction of light at boundaries between media and subsequent image formation will be dealt with in detail. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be studied in this course. Attention will be given to the system of surfaces and/or lenses and their imaging properties. The effect of aperture stops on the quality of images, such as blur and aberrations, depth of field and depth of focus, will also be studied.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Nature of light – light as electromagnetic oscillation	CO1, CO2
	B	Ideas of sinusoidal oscillations; amplitude and phase; speed of light in vacuum and other media; refractive index.	CO3,CO4
	C	Wavefronts – spherical, elliptical and plane; Curvature and vergence; rays; convergence and divergence in terms of rays and vergence; vergence at a distance Refractive index; its dependence on wavelength.	CO1,CO2
	Unit 2		
	A	Plane mirrors – height of the mirror; rotation of the mirror; reflection by a spherical mirror – paraxial approximation; sign convention; derivation of vergence equation	CO2,CO4
	B	Imaging by concave mirror; Imaging by convex mirror;	CO1, CO3

		Reflectivity; transmittivity Fermat's and Huygen's Principle – Derivation of laws of reflection and refraction (Snell's law) from these principles.	
	C	Snell's Law; refraction at a plane surface, glass slab; displacement without deviation; displacement without dispersion.	CO1,CO3
	Unit 3		
	A	Thick prisms; angle of prism; deviation produced by a prism; refractive index of the prism Prisms; angular dispersion; dispersive power; Abbe's number.	CO2,CO4
	B	Definition of crown and flint glasses; materials of high refractive index; Thin prism – definition; definition of Prism diopter; deviation produced by a thin prism; it dependence on refractive index	CO1,CO3
	C	Refraction by a spherical surface; sign convention; introduction to spherical aberration using image formed by a spherical surface of a distance object; sag formula; Paraxial approximation; derivation of vergence equation; imaging by a positive powered surface, Imaging by a negative powered surface	CO1,CO2
	Unit 4		
	A	Vergence at a distance formula; effectivity of a refracting surface; definition of a lens as a combination of two surfaces; different types of lens shapes.	CO2
	B	Image formation by a lens by application of vergence at a distance formula; definitions of front and back vertex powers; equivalent power; first and second principal planes/points; primary and secondary focal planes/points; primary and secondary focal lengths	CO4
	C	Newton's formula; linear magnification; angular magnification; nodal Planes	CO1,CO3
	Unit 5		
	A	Thin lens as a special case of thick lens; review of sign convention; Imaging by a thin convex lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions	CO1,CO3
	B	Imaging by a thin concave lens; image properties (real/virtual; erect/inverted; magnified/minified) for various object positions Prentice's Rule	CO2
	C	System of two thin lenses; review of front and back vertex powers and equivalent power, review of six cardinal points; System of more than two thin lenses; calculation	CO4

		of equivalent power using magnification formula			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• Tunnacliffe A. H, Hirst J. G, *Optics*, The association of British Dispensing Opticians, London, U.K., 1990. • Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998.			
	Other References	• Loshin D. S. *The Geometric Optics Workbook*, Butterworth-Heinemann, Boston, USA, 1991. • Schwartz S. H. *Geometrical and Visual Optics: A Clinical Introduction*, McGraw-Hill, New York, USA, 2002.			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP001	
2	Course Title	Optometric Procedures-I	
3	Credits	2	
4	Contact Hours (L-T)	4	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts that would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	The completion of this course will help in thorough knowledge of mirrors, lenses and instruments	
8	Outline syllabus		CO Mapping

	Unit 1		
	A	Anterior segment of eye	CO1, CO2
	B	Posterior segment of eye	CO3,CO4
	C	Ocular adnexa	CO1,CO2
	Unit 2		
	A	Trial box contents, various types of lenses, it purpose	CO2,CO4
	B	The image shift with the trial lenses.	CO1, CO3
	C	Hand Neutralisation of Trial Lenses	CO1,CO3
	Unit 3		
	A	History Taking	CO2,CO4
	B	Basic Eye Examination	CO1,CO3
	C	History Taking department wise	CO1,CO2
	Unit 4		
	A	Infection Control-1	CO2
	B	Infection Control-2	CO4
	C	Infection Control-3	CO1,CO3
	Unit 5		
	A	Visual Acuity	CO1,CO3
	B	Taking Visual acuity	CO2
	C	Documenting Visual acuity	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• Tunnacliffe A. H, Hirst J. G, *Optics*, The association of British Dispensing Opticians, London, U.K., 1990. • Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998.	
	Other References	• Loshin D. S. *The Geometric Optics Workbook*, Butterworth-Heinemann, Boston, USA, 1991.	

		• Schwartz S. H. *Geometrical and Visual Optics: A Clinical Introduction*, McGraw-Hill, New York, USA, 2002.	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 1st**	
1	Course Code	BOP104	
2	Course Title	English and Communication-I	
3	Credits	1	
4	Contact Hours (L)	1	
	Course Type	Compulsory	
5	Course Objective	This course trains the students in oral presentations, expository writing, logical organization and structural support	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising nutrients require for human eye. CO2: understanding, characterising, explaining, identifying and locating the nutrients require for human eye. CO3: performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the nutrients require for human eye. CO4: analysing, categorising, comparing and differentiating the nutrients require for human eye.	
7	Course Description	This course deals with essential functional English aspects and nuances of communication skills essential for health care professionals.	
8	Outline syllabus		CO Mapping
	Unit 1	**Basics of Grammar-I**	
	A	• Vocabulary, Synonyms, Antonyms	CO1, CO2
	B	• Prefix and Suffix, Homonyms	CO3,CO4
	C	• Analogies and Portmanteau words	CO1,CO2
	Unit 2	**Basics of Grammar-II**	
	A	• Active and Passive voice	CO2,CO4
	B	• Direct and Indirect speech	CO1, CO3

	C	• Prepositions, Conjunctions and Euphemisms			CO1,CO3
	Unit 3	**Writing Skills**			
	A	• Letter writing, Email			CO2,CO4
	B	• Essay, Articles, Memos			CO1,CO3
	C	• Note making and Comprehension, One word substitutes			CO1,CO2
	Unit 4	**Writing and Reading**			
	A	• Summary writing,			CO2
	B	• Creative writing,			CO4
	C	• Newspaper reading			CO1,CO3
	Unit 5	**Practical Exercise**			
	A	• Formal speech			CO1,CO3
	B	• Phonetics			CO2
	C	• Semantics and pronunciation			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• Graham Lock: Functional English Grammar; Introduction to second Language Teachers, Cambridge University Press, New York, 1996			
	Other References	As recommended by the Faculty			

School: SAHS		**Batch : 2020-2024**
Program: BOP		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP110
2	Course Title	Basic Biochemistry-II
3	Credits	3
4	Contact Hours (L-T)	2-1
	Course Type	Compulsory
5	Course Objective	Understanding, characterising, explaining, identifying and locating the biochemical present, analysing, categorising, comparing and differentiating the biochemical present in the human body.

6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the biochemical of the human body. CO2:understanding, characterising, explaining, identifying and locating the biochemical present in the human body. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to human eye. CO4:analysing, categorising, comparing and differentiating the biochemical present in the human body.			
7	Course Description	This course is being taught in two consecutive semesters. Basic Biochemistry-II deals with metabolism that takes place in the human body. It also deals in ocular biochemistry in details. Clinical estimation as well as the clinical significance of biochemical values is also taught.			
8	Outline syllabus				CO Mapping
	Unit 1	**Enzyme kinetics and Cell biology**			
	A	Enzyme kinetics			CO1, CO2
	B	Clinical enzymology			CO3,CO4
	C	Cell biology			CO1,CO2
	Unit 2	**Protein chemistry and metabolism**			
	A	Protein and amino acid chemistry			CO2,CO4
	B	Digestion and absorption of Protein			CO1, CO3
	C	Metabolism of Protein			CO1,CO3
	Unit 3	**Vitamins and minerals metabolism**			
	A	Mineral Metabolism			CO2,CO4
	B	Fat soluble vitamins			CO1,CO3
	C	Water soluble vitamins			CO1,CO2
	Unit 4	**Nucleic acid chemistry**			
	A	Nucleosides and its importance			CO2
	B	Nucleotides and its importance			CO4
	C	Nucleic acid Chemistry			CO1,CO3
	Unit 5	**Ocular biochemistry and Immunology**			
	A	Ocular biochemistry			CO1,CO3
	B	Immunology			CO2
	C	ELISA and RIA			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	**Text Book of Medical Biochemistry**			
	Other References	S. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications , 1992			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 2nd**	
1	Course Code	BOP159	
2	Course Title	Basic Biochemistry-II (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	Understanding, characterising, explaining, identifying and locating the biochemical present, analysing, categorising, comparing and differentiating the biochemical present in the human body.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the biochemical of the human body. CO2:understanding, characterising, explaining, identifying and locating the biochemical present in the human body. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to human eye. CO4:analysing, categorising, comparing and differentiating the biochemical present in the human body.	
7	Course Description	This course is being taught in two consecutive semesters. Basic Biochemistry-II deals with metabolism that takes place in the human body. It also deals in ocular biochemistry in details. Clinical estimation as well as the clinical significance of biochemical values is also taught.	
8	Outline syllabus		CO Mapping
	Unit 1	**Preparation of reagents**	
	A	Preparation of acid, bases and solutions of different concentration	CO1, CO2
	B	Preparation of acid	CO3,CO4
	C	Preparation of acid, bases	CO1,CO2
	Unit 2	**Qualitative analysis of Carbohydrates**	
	A	Qualitative analysis of Carbohydrates-1	CO2,CO4
	B	Qualitative analysis of Carbohydrates-2	CO1, CO3
	C	Qualitative analysis of Carbohydrates-3	CO1,CO3
	Unit 3	**Qualitative analysis of Proteins**	
	A	Qualitative analysis of Proteins-1	CO2,CO4
	B	Qualitative analysis of Proteins-2	CO1,CO3
	C	Qualitative analysis of Proteins-3	CO1,CO2
	Unit 4	**Qualitative analysis of Lipid**	
	A	Qualitative analysis of Lipid-1	CO2
	B	Qualitative analysis of Lipid-2	CO4
	C	Qualitative analysis of Lipid-3	CO1,CO3
	Unit 5	**Introduction of colorimetry**	
	A	Verification of Beer law	CO1,CO3
	B	Verification of Lambert law	CO2
	C	Demonstration of colorimeter	CO4

	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	**Text Book of Medical Biochemistry**		
	Other References	S. Ramakrishnan: Essentials of biochemistry and ocular biochemistry, Annamalai University Publications , 1992		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 2nd**	
1	Course Code	BOP111	
2	Course Title	Ocular Anatomy	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	• Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa • Identify the microscopic structures of various tissues in the eye and correlate the structure with the functions. • Comprehend the basic structure and connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution. • To understand the basic principles of ocular embryology.	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the anatomical structure of the human body. CO2:**Comprehension:** understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general anatomy in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the anatomical structure of the human body.	
7	Course Description	This course deals with detailed anatomy of the orbit, eyeball and cranial nerves associated with ocular functions.	
8	Outline syllabus		CO Mapping
	Unit 1	**The Sensory Organs**	
	A	Structure of skin, ear, nose, tongue	CO1, CO2
	B	Structure of auditory and olfactory apparatus	CO3,CO4
	C	Applied anatomy	CO1,CO2
	Unit 2	**The Endocrine System**	
	A	Structure of Pituitary, Pancreas, thyroid	CO2,CO4

	B	Structure of Parathyroid, thymus and adrenal glands			CO1, CO3
	C	Applied anatomy			CO1,CO3
	Unit 3	**Detail study of orbit**			
	A	Contents of orbit; Blood supply of orbit			CO2,CO4
	B	Extraocular muscles			CO1,CO3
	C	Detailed study of each of the following nerves in terms of their nuclei, course, relationship with brain, effects of compression at different regions; Optic nerve, Oculomotor nerve, Trochlear nerve, Trigeminal nerve, Abducent nerve and Facial nerve			CO1,CO2
	Unit 4	**Layers of eye ball**			
	A	Embryology of eye; Ocular Adnexa and Lacrimal system			CO2
	B	Sclera , cornea ,choroid , ciliary body ,iris and retina			CO4
	C	Applied anatomy			CO1,CO3
	Unit 5	**Chambers of eye**			
	A	Aqueous humour; Vitreous body			CO1,CO3
	B	Lens			CO2
	C	Applied anatomy			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Human Anatomy by Japee brothers			
	Other References	Anatomy and Physiology of human body			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP160
2	Course Title	Ocular Anatomy (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	• Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa • Identify the microscopic structures of various tissues in the eye and correlate the structure with the functions. • Comprehend the basic structure and connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution. • To understand the basic principles of ocular embryology.

6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the anatomical structure of the human body. CO2:**Comprehension:** understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general anatomy in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the anatomical structure of the human body.		
7	Course Description	This course deals with detailed anatomy of the orbit, eyeball and cranial nerves associated with ocular functions.		
8	Outline syllabus			CO Mapping
	Unit 1	**The Sensory Organs**		
	A	Practical demonstration of skin, ear using specimen or video		CO1, CO2
	B	Practical demonstration of auditory and olfactory apparatus using specimen or video		CO3,CO4
	C	Practical demonstration of nose, tongue using specimen or video		CO1,CO2
	Unit 2	**The Endocrine System**		
	A	Practical demonstration of Pituitary, Pancreas using specimen or video		CO2,CO4
	B	Practical demonstration of thymus and adrenal glands using specimen or video		CO1, CO3
	C	Practical demonstration of thyroid and Parathyroid using specimen or video		CO1,CO3
	Unit 3	**Detail study of orbit**		
	A	Practical demonstration of orbit and blood supply using specimen or video		CO2,CO4
	B	Practical demonstration of extra-ocular muscle using specimen or video		CO1,CO3
	C	Practical demonstration of nerve supply of the orbit using specimen or video		CO1,CO2
	Unit 4	**Layers of eye ball**		
	A	Practical demonstration of ocular adnexa and lacrimal system using specimen or video		CO2
	B	Practical demonstration of Sclera , cornea using specimen or video		CO4
	C	Practical demonstration of choroid, ciliary body, iris and retina using specimen or video		CO1,CO3
	Unit 5	**Chambers of eye**		
	A	Practical demonstration of aqueous humour using specimen or video		CO1,CO3
	B	Practical demonstration of vitreous body using specimen or video		CO2
	C	Practical demonstration of Lens using specimen or video		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	

	Text book/s*	Human Anatomy by Japee brothers	
	Other References	Anatomy and Physiology of human body	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 2nd**	
1	Course Code	BOP112	
2	Course Title	Ocular Physiology	
3	Credits	4	
4	Contact Hours (L-T)	3-1	
	Course Type	Compulsory	
5	Course Objective	1. Understanding, characterizing, explaining, identifying and locating physiology of the human body.. 2.Identifying and locating the physiological structure of the human body	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the physiological structure of the human eye CO2:**Comprehension:** understanding, characterizing, explaining, identifying and locating the physiological structure of the human eye. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general physiology in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the physiological structure of the human eye.	
7	Course Description	Ocular physiology deals with the physiological functions of each part of the eye.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Protective mechanisms in the eye	CO1, CO2
	B	Precorneal tear film, eyelids and lacrimation	CO3,CO4
	C	Extrinsic Ocular muscles, their actions and control of their movements	CO1,CO2
	Unit 2		
	A	Saccadic, smooth pursuit and Nystagmic eye movements	CO2,CO4
	B	Corneal Physiology	CO1, CO3
	C	Uveal tissue	CO1,CO3
	Unit 3		
	A	Physiology of Aqueous humor and vitreous	CO2,CO4
	B	Physiology of Iris and pupil	CO1,CO3
	C	Physiology of Crystalline lens and accommodation	CO1,CO2
	Unit 4		
	A	Retina	CO2
	B	Contrast visual acuity	CO4

	C	Visual acuity, vernier acuity and principle of measurement			CO1,CO3
	Unit 5				
	A	Visual perception- Binocular vision, stereoscopic vision, optical illusion			CO1,CO3
	B	Visual pathway, central and cerebral connections, lesions of pathway and effects			CO2
	C	Colour vision and colour defects. Theories and diagnostic tests			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Human Physiology by Japee brothers			
	Other References	Anatomy and Physiology of human body			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 2nd**	
1	Course Code	BOP161	
2	Course Title	Ocular Physiology (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	1.Understanding, characterizing, explaining, identifying and locating physiology of the human body.. 2.Identifying and locating the physiological structure of the human body	
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognizing the physiological structure of the human eye CO2:**Comprehension:** understanding, characterizing, explaining, identifying and locating the physiological structure of the human eye. CO3: **Application:** performing, demonstrating, implementing and applying the concept of general physiology in better understanding the relevance to human eye. CO4: **Analysis:** analyzing, categorizing, comparing and differentiating the physiological structure of the human eye.	
7	Course Description	**Physiology of eye**	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	TBUT	CO1, CO2
	B	Tests for lacrimation	CO3,CO4
	C	Schirmer test	CO1,CO2
	Unit 2		

	A	Extraocular movement		CO2,CO4
	B	Lid Movements		CO1, CO3
	C	Pupillary reflexes		CO1,CO3
	Unit 3			
	A	Applanation tonometer		CO2,CO4
	B	Schiotz tonometry		CO1,CO3
	C	Measurement of accommodation and convergence		CO1,CO2
	Unit 4			
	A	Visual acuity measurement		CO2
	B	Direct Ophthalmoscopy		CO4
	C	Binocular vision Grades assessment		CO1,CO3
	Unit 5			
	A	Retinoscopy		CO1,CO3
	B	Contrast visual acuity assessment		CO2
	C	Colour vision assessment		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	Human Physiology by Japee brothers		
	Other References	Anatomy and Physiology of human body		

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP113
2	Course Title	Geometrical Optics-II
3	Credits	4
4	Contact Hours (L-T)	3-1
	Course Type	Compulsory
5	Course Objective	At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye. Also to equip the students with a thorough knowledge of mirrors and lenses.
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye
7	Course Description	Geometric Optics is the study of light and its behavior as it propagates in a variety of media. Specifically, the phenomena of reflection and refraction of light at boundaries between media and subsequent image

		formation will be dealt with in detail. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be studied in this course. Attention will be given to the system of surfaces and/or lenses and their imaging properties. The effect of aperture stops on the quality of images, such as blur and aberrations, depth of field and depth of focus, will also be studied	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Cylindrical Lenses; image formation; relation between cylinder axis and line image orientation; Imaging due to two cylinders in contact with axes parallel	CO1, CO2
	B	Two cylinders in contact with axes perpendicular; line images and their orientations to the cylinders' powers; interval of Sturm; circle of least confusion (CLC); spherical equivalent; position of CLC	CO3,CO4
	C	Spherical lens and a cylindrical lens in contact; spherical equivalent; interval of Sturm and CLC; Spherocylindrical lens notations – plus/minus cylinder form, cross cylinder/meridian form; transformations between them	CO1,CO2
	Unit 2		
	A	Field stops and apertures; entrance and exit pupils	CO2,CO4
	B	Apertures and defocus blur	CO1, CO3
	C	Receiver/detector diameter; depth of focus; depth of field	CO1,CO3
	Unit 3		
	A	Chromatic Aberrations; methods of removing chromatic aberrations; Abbe number; Monochromatic Aberrations – deviation from paraxial approximation; difference between ray aberrations and wavefront aberrations	CO2,CO4
	B	Third order aberrations – spherical aberrations; coma; astigmatism; distortion and curvature of fields	CO1,CO3
	C	Ways of minimizing spherical aberrations – pupil size, bending of lens, shape factor; Lens tilt – astigmatism; Higher order aberrations; introduction to Zernike Polynomials	CO1,CO2
	Unit 4		
	A	Telescopes – Keplerian, Galilean and Newtonian; position of cardinal points,	CO2
	B	Entrance and exit pupils; magnifications; advantages and disadvantages	CO4
	C	Microscopes – magnification; tube length.	CO1,CO3
	Unit 5		
	A	Gullstrand's Schematic Eye (GSE); calculation of the power of the cornea, the lens and the eye; axial length; calculation of the position of the cardinal points; magnification; GSE - Purkinje images and their	CO1,CO3

		reflectances			
	B	GSE - entrance and exit pupils for a 3mm pupil; ocular aberrations – spherical aberrations and coma; chromatic aberrations; GSE – introduction to refractive errors - myopia and hyperopia; corneal curvature; axial length; far point; blur size calculations; corrections; astigmatism; blur size; circle of least confusion; correction.			CO2
	C	GSE - Object closer than at infinity; introduction to accommodation; far point; near point; presbyopia; spectacle and contact Lens corrections - comparison of magnification			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• Tunnacliffe A. H, Hirst J. G, *Optics*, The association of British Dispensing Opticians, London, U.K., 1990. • Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998.			
	Other References	• Loshin D. S. *The Geometric Optics Workbook*, Butterworth-Heinemann, Boston, USA, 1991. • Schwartz S. H. *Geometrical and Visual Optics: A Clinical Introduction*, McGraw-Hill, New York, USA, 2002.			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP162
2	Course Title	Geometrical Optics-II(LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye. Also to equip the students with a thorough knowledge of mirrors and lenses.

6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	Geometric Optics is the study of light and its behavior as it propagates in a variety of media. Specifically, the phenomena of reflection and refraction of light at boundaries between media and subsequent image formation will be dealt with in detail. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be studied in this course. Attention will be given to the system of surfaces and/or lenses and their imaging properties. The effect of aperture stops on the quality of images, such as blur and aberrations, depth of field and depth of focus, will also be studied	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	▪ Thick Prism – determination of prism angle and dispersive power; calculation of the refractive index	CO1, CO2
	B	▪ Thin Prism – measurement of deviation; calculation of the prism diopter	CO3,CO4
	C	▪ Image formation by spherical mirrors	CO1,CO2
	Unit 2		
	A	▪ Convex lens - power determination using lens gauge, power determination using distant object method; power determination using the vergence formula	CO2,CO4
	B	▪ Concave lens – in combination with a convex lens – power determination.	CO1, CO3
	C	▪ Construction of a tabletop telescope – all three types of telescopes.	CO1,CO3
	Unit 3		
	A	▪ Construction of a tabletop microscope	CO2,CO4
	B	▪ Imaging by a cylindrical lens – relationship between cylinder axis and image orientation	CO1,CO3
	C	▪ Imaging by two cylinders in contact – determination of the position of CLC; verification of CLC using a spherical lens with power equal to the spherical	CO1,CO2

		equivalent; orientations	
	Unit 4		
	A	▪ Thick Prism – determination of prism angle and dispersive power; calculation of the refractive index	CO2
	B	▪ Thin Prism – measurement of deviation; calculation of the prism diopter	CO4
	C	▪ Image formation by spherical mirrors	CO1,CO3
	Unit 5		
	A	▪ position of the line images and their relation to the cylinders' powers and orientations	CO1,CO3
	B	▪ Imaging by a spherocylindrical lens – sphere and cylinder in contact – determination of the position of CLC; verification of CLC using a spherical lens with power equal to the spherical equivalent; orientations and position of the line images and their relation to the cylinder's power and orientation	CO2
	C	▪ position of the line images and their relation to the cylinders' powers and orientations	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• Tunnacliffe A. H, Hirst J. G, *Optics*, The association of British Dispensing Opticians, London, U.K., 1990. • Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998.	
	Other References	• Loshin D. S. *The Geometric Optics Workbook*, Butterworth-Heinemann, Boston, USA, 1991. • Schwartz S. H. *Geometrical and Visual Optics: A Clinical Introduction*, McGraw-Hill, New York, USA, 2002.	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP114
2	Course Title	Nutrition
3	Credits	2
4	Contact Hours (L)	2
	Course Type	Compulsory

5	Course Objective	At the end of the course student would have gained the knowledge of the following: Balanced diet. Protein, carbohydrates, vitamins, Minerals, carotenoids and eye, Nutrition and Ocular aging and adverse effects of ocular nutritional supplements	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising nutrients require for human eye. CO2:understanding, characterising, explaining, identifying and locating the nutrients require for human eye. CO3:performing, demonstrating, implementing and applying the concept of biochemistry in better understanding the relevance to the nutrients require for human eye. CO4:analysing, categorising, comparing and differentiating the nutrients require for human eye.	
7	Course Description	This course covers the basic aspects of Nutrition for good health. It also includes nutrients and nutrients derivatives relevant to ocular health, nutrition deficiency and ocular disease, Nutrition and ocular aging, contraindications, adverse reactions and ocular nutritional supplements.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	• Introduction to Nutrition and Food Science,	CO1, CO2
	B	• Food Groups and Food Pyramid	CO3,CO4
	C	• Balanced diet for different age groups, Recommended dietary Allowances	CO1,CO2
	Unit 2		
	A	• Assessment of Nutritional Status.	CO2,CO4
	B	• Energy – Units, Metabolisms, Energy expenditure, and Energy imbalance.	CO1, CO3
	C	• Digestion, absorption and transport of Food	CO1,CO3
	Unit 3		
	A	• Oxidative stress and the eye	CO2,CO4
	B	• Carotenoids and eye	CO1,CO3
	C	• Minerals and trace elements and eye	CO1,CO2
	Unit 4		
	A	• Vitamins and eye	CO2

	B	• Carbohydrates and eye			CO4
	C	• Lipids and eye; Proteins and eye			CO1,CO3
	Unit 5				
	A	• Vitamin A, C and E deficiency			CO1,CO3
	B	• Nutrition and ocular aging			CO2
	C	• Contraindications, Adverse reactions and ocular nutritional supplements			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• M. Swaminathan: Hand book of Food and Nutrition, 5th edition, Bangalore printing & publishing Co.Ltd, Bangalore, 2004. • C. Gopalan: Nutritive value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad,2004			
	Other References	As recommended by the Faculty			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 2nd**
1	Course Code	BOP002
2	Course Title	Clinical Optometry-II
3	Credits	2
4	Contact Hours (L-T)	4
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts that would lay the foundation for their courses in the next semester.
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for

		their courses in the next semester.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	• Objective refraction Principles of Retinoscopy	CO1, CO2
	B	• Instrumentation brief and purpose	CO3,CO4
	C	• Retinoscopy demonstration and practical on model eyes.	CO1,CO2
	Unit 2		
	A	• Pupillary reflex test	CO2,CO4
	B	• Anterior segment examination with torch light	CO1, CO3
	C	• Slit lamp examination – demo	CO1,CO3
	Unit 3		
	A	• Fundus demonstration by ophthalmoscopy	CO2,CO4
	B	• Visual field testing	CO1,CO3
	C	• Contrast visual acuity	CO1,CO2
	Unit 4		
	A	• Near point of convergence	CO2
	B	• Cover test	CO4
	C	• Ocular Motility	CO1,CO3
	Unit 5		
	A	• Colour vision	CO1,CO3
	B	• IPD	CO2
	C	• Stereopsis	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• Tunnacliffe A. H, Hirst J. G, *Optics*, The association of British Dispensing Opticians, London, U.K., 1990. • Pedrotti L. S, Pedrotti Sr. F. L, *Optics and Vision*, Prentice Hall, New Jersey, USA, 1998.	
	Other References	• Loshin D. S. *The Geometric Optics Workbook*, Butterworth-Heinemann, Boston, USA, 1991. • Schwartz S. H. *Geometrical and Visual Optics: A Clinical Introduction*, McGraw-Hill, New York, USA, 2002.	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP209	
2	Course Title	Microbiology	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	• To prepare the students to gain essential knowledge about the characteristics of bacteria, viruses, fungi and parasites • To acquire knowledge of the principles of sterilisation and disinfection in hospital and ophthalmic practice • To understand the pathogenesis of the diseases caused by the organisms in the human body with particular reference to the eye infections • To understand basic principles of diagnostic ocular Microbiology.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the extremely small forms of life. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the extremely small forms of life. **CO3; Application:** performing, demonstrating, implementing and applying the concept of microbiology in better understanding the relevance to human eye. **CO4: Analysis:** analysing, categorising, comparing and differentiating the the extremely small forms of life.	
7	Course Description	This course covers the basic biological, biochemical and pathogenic characteristics of pathogenic organisms	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Introduction to Microbiology,	CO1, CO2
	B	Types of Microorganisms, Physiology of Microorganisms	CO3,CO4
	C	Nutrition, Enzymes, Metabolism and energy, Microbial Growth	CO1,CO2
	Unit 2		
	A	Sterilization and disinfection:	CO2,CO4
	B	Sterilization in the laboratory,	CO1, CO3
	C	Control of Microbial Growth	CO1,CO3
	Unit 3		
	A	Microbes versus Humans- The development of Infection,	CO2,CO4
	B	The disease process	CO1,CO3
	C	Pathogenicity and virulence	CO1,CO2
	Unit 4		
	A	Ocular Bacteriology - Gram positive,(Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus,	CO2

		propionibacterium, actinomyces, Nocardia)			
	B	Bacteria including acid fast bacilli (Mycobacterium tuberculosis, Mycobacterium leprae)			CO4
	C	Ocular Bacteriology - Gram negative Bacteria (pseudomonas, haemophiilus, Brucella, Neisseria, Moraxella) Spirochetes (Treponema, Leptospiraceae)			CO1,CO3
	Unit 5				
	A	Virology: Classification of Viruses in Ocular Disease, Rubella, Adenovirus, Oncogenic Viruses (HPV, HBV, EBV, Retroviruses), HIV.			CO1,CO3
	B	Fungi : Yeasts, Filamentous, Dimorphic			CO2
	C	Intracellularparasites- Chlamydia, Protozoa (Toxoplasmosis, Acanthamoeba)			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s	• BURTON G.R.W: Microbiology for the Health Sciences, third edition, J.P. Lippincott Co., St. Louis, 1988. • M J Pelczar (Jr),ECS Chan, NR Krieg : Microbiology ,fifth edition, TATA McGRAW-HILL Publisher, New Delhi,1993			
	Reference Books	• KJ Ryan, CG Ray: Sherris Medical Microbiology- An Introduction to infectious Diseases, fourth edition, McGRAWHiLL Publisher, NewDelhi, 1994 • MACKIE & McCartney Practical Medical Microbiology • SYDNEY M. FINEGOLD & ELLEN JO BARON: Diagnostic Microbiology (DM) • As per faculty recommendation			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 3rd**
1	Course Code	BOP258
2	Course Title	Microbiology(LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts that would lay the foundation for their

		courses in the next semester.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the extremely small forms of life. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the extremely small forms of life. **CO3; Application:** performing, demonstrating, implementing and applying the concept of microbiology in better understanding the relevance to human eye. **CO4: Analysis:** analysing, categorising, comparing and differentiating the the extremely small forms of life.	
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for their courses in the next semester.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Basic Lab glassware: Test tubes, screw capped tubes,	CO1, CO2
	B	Pipette, Pasteur pipettes, pipette tips, cover slip and slides.	CO3,CO4
	C	Erlenmeyer flask, Eppendorf tubes,	CO1,CO2
	Unit 2		
	A	Basic Lab instrumentation: Autoclave, incubator, Hot air oven,	CO2,CO4
	B	pH meter, Centrifuge, Laminar air flow.	CO1, CO3
	C	Separatory funnel, centrifuge, pH meter, Electric balance, hot plate	CO1,CO3
	Unit 3		
	A	Identify various microorganisms	CO2,CO4
	B	Practical demo of various cultural media preparations	CO1,CO3
	C	Practical demo of growth of microorganism on cultural medias	CO1,CO2
	Unit 4		
	A	Gram's stain test	CO2
	B		CO4
	C	ZN stain test	CO1,CO3
	Unit 5		
	A	Biochemical test	CO1,CO3
	B		CO2
	C		CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	

	Text book/s*	• BURTON G.R.W: Microbiology for the Health Sciences, third edition, J.P. Lippincott Co., St. Louis, 1988. • M J Pelczar (Jr),ECS Chan, NR Krieg : Microbiology ,fifth edition, TATA McGRAW-HILL Publisher, New Delhi,1993	
	Reference Books	• KJ Ryan, CG Ray: Sherris Medical Microbiology- An Introduction to infectious Diseases, fourth edition, McGRAWHiLL Publisher, NewDelhi, 1994 • MACKIE & McCartney Practical Medical Microbiology • SYDNEY M. FINEGOLD & ELLEN JO BARON: Diagnostic Microbiology (DM) • As per faculty recommendation	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP206	
2	Course Title	Applied Optics-I	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about lenses, prisms, which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect.	
8	Outline syllabus		CO Mapping
	Unit 1	**Light, Mirror, prism**	
	A	Introduction – Light, Mirror, Reflection, Refraction and	CO1, CO2

		Absorption	
	B	Prisms – Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units	CO3,CO4
	C	Sign Conventions, Fresnel's prisms, rotary prims	CO1,CO2
	Unit 2	**Lenses**	
	A	Lenses – Definition, units, terminology used to describe, form of lenses	CO2,CO4
	B	Vertex distance and vertex power, Effectivity calculations	CO1, CO3
	C	Lens shape, size and types i.e. spherical, cylindrical and Sphero-cylindrical	CO1,CO3
	Unit 3	**Transposition and prismatic effect**	
	A	Transpositions – Simple, Toric and Spherical equivalent	CO2,CO4
	B	Prismatic effect, centration, decent ration and Prentice rule	CO1,CO3
	C	Prismatic effect of Plano-cylinder and Spherocylinder lenses	CO1,CO2
	Unit 4	**Spherometer**	
	A	Spherometer & Sag formula, Edge thickness calculations	CO2
	B	Magnification in high plus lenses, Minification in high minus lenses	CO4
	C	Tilt induced power in spectacles and aberration in Ophthalmic Lenses	CO1,CO3
	Unit 5	**Lens: properties and measurement of power**	
	A	The characteristics of lens material properties (Refractive index, specific gravity, UV cut off, impact resistance – include drop ball test, abbe value, Center thickness)	CO1,CO3
	B	Measurement of lens power.	CO2
	C	Quality control	CO4
	Mode of examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	• Troy Fennin :Clinical Optics,,ButterworthHeinmann • Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1972 • C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann, USA, 1996	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP206	
2	Course Title	Applied Optics-I(LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about lenses, prisms, which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Practical based on Introduction – Light, Mirror, Reflection, Refraction and Absorption	CO1, CO2
	B	Practical based on Prisms – Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units	CO3,CO4
	C	Sign Conventions, Fresnel's prisms, rotary prims	CO1,CO2
	Unit 2		
	A	Practical based on Lenses – Definition, units, terminology used to describe, form of lenses	CO2,CO4
	B	Practical based on Vertex distance and vertex power, Effectivity calculations	CO1, CO3
	C	Practical based on Lens shape, size and types i.e. spherical, cylindrical and Sphero-cylindrical	CO1,CO3
	Unit 3		
	A	Practical based on Transpositions – Simple, Toric and	CO2,CO4

		Spherical equivalent		
	B	Practical based on Prismatic effect, centration, decent ration and Prentice rule		CO1,CO3
	C	Prismatic effect of Plano-cylinder and Spherocylinder lenses		CO1,CO2
	Unit 4			
	A	Practical based on Spherometer& Sag formula, Edge thickness calculations		CO2
	B	Practical based on Magnification in high plus lenses, Minification in high minus lenses		CO4
	C	Practical based on Tilt induced power in spectacles and aberration in Ophthalmic Lenses		CO1,CO3
	Unit 5			
	A	Practical based on The characteristics of lens material properties (Refractive index, specific gravity, UV cut off, impact resistance – include drop ball test, abbe value, Center thickness)		CO1,CO3
	B	Practical based on Measurement of lens power.		CO2
	C	Practical based on Quality control.		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	• Troy Fennin :Clinical Optics,,ButterworthHeinmann • Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1972 • C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann, USA, 1996		

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 3rd**
1	Course Code	BOP207
2	Course Title	Visual Optics-I (Visual Perception & Neurophysiology)
3	Credits	4
4	Contact Hours (P)	3+1
	Course Type	Compulsory
5	Course Objective	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.
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising the optics of human eye. CO2: Understanding, characterising, explaining, identifying and locating

		the optics of human eye. CO3: performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye			
7	Course Description	This course deals with the concept of eye as an optical instrument and thereby covers various optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors			
8	Outline syllabus				CO Mapping
	Unit 1	**Review of Geometrical Optics: Vergence and power**			
	A	Conjugacy, object space and image space; Sign convention; Spherical refracting surface			CO1, CO2
	B	Spherical mirror; catoptric power; Cardinal points; Magnification; Light and visual function			CO3,CO4
	C	Clinical Relevance of: Fluorescence, Interference, Diffraction, Polarization, Birefringence, Dichroism; Aberration and application Spherical and Chromatic			CO1,CO2
	Unit 2	**Optics of Ocular Structure**			
	A	Cornea and aqueous			CO2,CO4
	B	Crystalline lens; Vitreous			CO1, CO3
	C	Schematic and reduced eye			CO1,CO3
	Unit 3	**Measurements of Optical Constants of the Eye**			
	A	Corneal curvature and thickness; Keratometry			CO2,CO4
	B	Curvature of the lens and ophthalmophakometry			CO1,CO3
	C	Axial and axis of the eye			CO1,CO2
	Unit 4	**Basic Aspects of Vision**			
	A	Visual Acuity			CO2
	B	Light and Dark Adaptation; Color Vision			CO4
	C	Spatial and Temporal Resolution; Science of Measuring visual performance and application to Clinical Optometry			CO1,CO3
	Unit 5	**Refractive anomalies and their causes**			
	A	Etiology of refractive anomalies; Contributing variability and their ranges			CO1,CO3
	B	Populating distributions of anomalies			CO2
	C	Optical component measurements; Growth of the eye in relation to refractive errors			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• A H Tunnacliffe: Visual optics, The Association of British Optician, 1987 • AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998 □ BHVI student notes			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP256	
2	Course Title	Visual Optics-I (Visual Perception & Neurophysiology) (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	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.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with the concept of eye as an optical instrument and thereby covers various optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors	
8	Outline syllabus		CO Mapping
	Unit 1	**Review of Geometrical Optics: Vergence and power**	
	A	Practical with spherical refracting surface	CO1, CO2
	B	Practical with spherical mirror	CO3,CO4
	C	Practical demonstration of; Fluorescence, Interference, Diffraction, Polarization, Birefringence, Dichroism	CO1,CO2
	Unit 2	**Optics of Ocular Structure**	
	A	Diagram of schematic eye model	CO2,CO4
	B	Diagram of optics of cornea	CO1, CO3
	C	Diagram of optics of lens	CO1,CO3
	Unit 3	**Measurements of Optical Constants of the Eye**	
	A	Measurement of corneal curvature	CO2,CO4
	B	Measurement of corneal thickness	CO1,CO3
	C	Practical demonstration of Keratometry	CO1,CO2
	Unit 4	**Basic Aspects of Vision**	
	A	Measurement of Visual Acuity	CO2
	B	Measurement of Contrast sensitivity	CO4
	C	Measurement of Colour Vision	CO1,CO3
	Unit 5	**Refractive anomalies and their causes**	

	A	Demonstration of dark adaptation		CO1,CO3
	B	Demonstration of light adaptation		CO2
	C	Measurement of optical components of the eye		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	A H Tunnacliffe: Visual optics, The Association of British Optician, 1987 AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998 BHVI student notes		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP210	
2	Course Title	Pathology	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	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.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the essential nature of disease. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the abnormalities present in human body. **CO3: Application:** performing, demonstrating, implementing and applying the concept of pathological changes in human body in better understanding the relevance to human eye. **CO4:** analysing, categorising, comparing and differentiating the structural and functional changes produced by any diseases.	
7	Course Description	This course describes basic aspects of disease processes with reference to specific entities relevant in optometry/ophthalmology.	
8	Outline syllabus		CO Mapping
	Unit 1	**General Pathology: Principles**	
	A	Inflammation and repair	CO1, CO2
	B	Infection in general	CO3,CO4
	C	Shock, Anaphylaxis, Allergy	CO1,CO2

	Unit 2	**Specific infections**			
	A	Tuberculosis			CO2,CO4
	B	Leprosy and Syphilis			CO1, CO3
	C	Fungal and Viral infections			CO1,CO3
	Unit 3	**Haematology**			
	A	Anemia and Leukemia			CO2,CO4
	B	Bleeding disorders			CO1,CO3
	C	Immune System			CO1,CO2
	Unit 4	**Circulatory disturbances**			
	A	Thrombosis			CO2
	B	Infarction			CO4
	C	Embolism			CO1,CO3
	Unit 5	**Ocular Pathology**			
	A	Infections of ocular surface			CO1,CO3
	B	Pathology of cornea and Conjunctiva			CO2
	C	Pathology of Uvea			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• CORTON KUMAR AND ROBINS: Pathological Basis of the Disease, 7th Edition, Elsevier, newDelhi, 2004. • S R Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993.			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 3rd**
1	Course Code	BOP208
2	Course Title	Ocular Disease-I
3	Credits	4
4	Contact Hours (L+T)	3+1
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be knowledgeable in the following aspects of ocular diseases: Etiolog; Epidemiology; Symptoms; Signs; Course sequelae of ocular disease; Diagnostic approach and Management of the ocular diseases
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the diseases of anterior segment of human eye. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the various diseases of the human eye. **CO3: Application:** performing, demonstrating, implementing and

		applying the concept of prognosis and pathophysiology of different ocular diseases which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of diseases.	
7	Course Description	This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases	
8	Outline syllabus		CO Mapping
	Unit 1	**Orbit**	
	A	Proptosis (Classification, Causes, Investigations); Enophthalmos; Developmental Anomalies (craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome)	CO1, CO2
	B	Orbital Inflammations (Preseptal cellulites, Orbital cellulitis Orbital Periostitis, cavernous sinus Thrombosis); Grave's Ophthalmopathy; Orbital tumors(Dermoids, capillary haemangioma, Optic nerve glioma)	CO3,CO4
	C	Orbital blowout fractures; Orbital surgery (Orbitotomy); Orbital tumors; Orbital trauma; Approach to a patient with proptosis	CO1,CO2
	Unit 2	**Lids**	
	A	Congenital anomalies (Ptosis, Coloboma, Epicanthus, Distichiasis, Cryptophthalmos); Oedema of the eyelid (Inflammatory, Solid, Passive edema) Inflammatory disorders (Blepharitis, External Hordeolum, Chalazion, Internal hordeolum, MolluscumContagiosum)	CO2,CO4
	B	Anomalies in the position of the lashes and Lid Margin (Trichiasis, Ectropion, Entropion, Symblepharon, Blepharophimosis, Lagophthalmos, Blepharospasm, Ptosis)	CO1, CO3
	C	Tumors (Papillomas, Xanthelasma, Haemangioma, Basal carcinoma, Squamous cell carcinoma, sebaceous gland melanoma)	CO1,CO3
	Unit 3	**Lacrimal System**	
	A	Tear Film; The Dry Eye (Sjogren's Syndrome)	CO2,CO4
	B	The watering eye (Etiology, clinical evaluation)	CO1,CO3
	C	Dacryocystitis; Swelling of the Lacrimal gland (Dacryoadenitis)	CO1,CO2
	Unit 4	**Conjunctiva and Cornea**	
	A	Inflammations of conjunctiva (Infective conjunctivitis – bacterial, chlamydial, viral , Allergic conjunctivitis, Granulomatous conjunctivitis); Degenerative conditions(Pinguecula, Pterygium, Concretions); Symptomatic	CO2

		conditions(Hyperaemia, Chemosis, Ecchymosis, Xerosis, Discoloration); Cysts and Tumors			
	B	Congenital Anomalies (Megalocornea, Microcornea, Cornea plana, Congenital cloudy cornea); Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and Non ulcerative); Etiological classifications: Infective, Allergic, Trophic, Traumatic, Idiopathic			CO4
	C	Degenerations; Dystrophies; Keratoconus, Keratoglobus; Corneal oedema, Corneal opacity, Corneal vascularisation; Penetrating Keratoplasty			CO1,CO3
	Unit 5	**Uveal Tract and Sclera**			
	A	Classification of uveitis; Etiology; Pathology; Anterior Uveitis; Posterior Uveitis			CO1,CO3
	B	Purulent Uveitis; Endophthalmitis; Panophthalmitis; Pars Planitis; Tumors of uveal tract(Melanoma)			CO2
	C	Episcleritis and scleritis; Clinical examination of Uveitis and Scleritis			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 3rd**
1	Course Code	BOP257
2	Course Title	Ocular Disease-I (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be knowledgeable in the following aspects of ocular diseases: Etiolog; Epidemiology; Symptoms; Signs; Course sequelae of ocular disease; Diagnostic approach and Management of the ocular diseases
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the diseases of anterior segment of human eye. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the various diseases of the human eye. **CO3: Application:** performing, demonstrating, implementing and applying the concept of prognosis and pathophysiology of different ocular diseases which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of diseases.

7	Course Description	This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases	
8	Outline syllabus		CO Mapping
	Unit 1	**Orbit**	
	A	Clinical identification of proptosis	CO1, CO2
	B	Clinical identification of orbital Inflammations	CO3,CO4
	C	Measurement of proptosis with exopthalmometer	CO1,CO2
	Unit 2	**Lids**	
	A	Clinical identification of Congenital anomalies and inflammatory disorders of lid	CO2,CO4
	B	Ptosis measurement	CO1, CO3
	C	Clinical identification of tumors and anomalies in the position of the lashes and Lid Margin	CO1,CO3
	Unit 3	**Lacrimal System**	
	A	Measurement of tear film anomalies	CO2,CO4
	B	Clinical identification of Dacryocystitis	CO1,CO3
	C	Clinical identification of Dacryoadenitis	CO1,CO2
	Unit 4	**Conjunctiva and Cornea**	
	A	Clinical identification of conjunctival diseases	CO2
	B	Clinical identification of different types of corneal inflammations	CO4
	C	Clinical identification of corneal degenerations and dystrophies; Keratoconus, Keratoglobus; Corneal oedema, Corneal opacity, Corneal vascularisation; Penetrating Keratoplasty	CO1,CO3
	Unit 5	**Uveal Tract and Sclera**	
	A	Clinical identification of uveitis	CO1,CO3
	B	Clinica; identification of Endophthalmitis	CO2
	C	Clinical identification of episcleritis and scleritis	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 3rd**	
1	Course Code	BOP003	
2	Course Title	Clinical Optometry-I	
3	Credits	4	
4	Contact Hours (P)	8	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basic knowledge about diagnostic procedures in different cases. Student will able to manage the outpatient department easily. This will master the students in freely diagnosing and handling variety of ocular abnormalities.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the diseases of anterior segment of human eye. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the various diseases of the human eye. **CO3: Application:** performing, demonstrating, implementing and applying the concept of prognosis and pathophysiology of different ocular diseases which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of diseases.	
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for their courses in the next semester.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	History taking,	CO1, CO2
	B	Visual acuity estimation	CO3,CO4
	C	Visual acuity recording	CO1,CO2
	Unit 2		
	A	Near point of accommodation, Near point of convergence	CO2,CO4
	B	Extraocular motility, Cover test, Alternating cover test	CO1, CO3
	C	Hirschberg test, Modified Krimsky,Pupils Examination, Maddox Rod, van Herrick	CO1,CO3
	Unit 3		
	A	External examination of the eye, Lid Eversion	CO2,CO4
	B	Schirmer's, TBUT, tear meniscus level, NITBUT (keratometer),	CO1,CO3
	C	Pupillary reflex test; Anterior segment examination with torch light – Slit lamp examination – demo	CO1,CO2
	Unit 4		
	A	Visual field testing	CO2
	B	Confrontation test, Amsler' grid; Colour vision; IPD;	CO4

		Stereopsis; Contrast visual acuity		
	C	Photostress test,Glare acuity		CO1,CO3
	Unit 5			
	A	Slit-lamp biomicroscopy		CO1,CO3
	B	Digital pressure, Schiotz Tonometry, Applanation Tonometry, non-contact tonometry; Gonioscopy		CO2
	C	Corneal Sensitivity, HVID, Keratometry; Saccades and Pursuits; Indirect ophthalmoscopy; Fundus examination by slit lamp biomicroscopy		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	5%	
	Text book/s*	• A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007 • D B. Elliott :Clinical Procedures in Primary Eye Care,3rd edition, Butterworth-Heinemann, 2007 • Jack J. Kanski Clinical Ophthalmology: A Systematic Approach,6th edition, Butterworth-Heinemann, 2007 • J.B Eskridge, J F. Amos, J D. Bartlett: Clinical Procedures in Optometry, Lippincott Williams and Wilkins,1991 • N B. Carlson , Dl Kurtz: Clinical Procedures for Ocular Examination,3rd edition, McGraw-Hill Medical, 2003		

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 3rd**
1	Course Code	BOP205
2	Course Title	English and Communication-II
3	Credits	1
4	Contact Hours (L)	1
	Course Type	Compulsory
5	Course Objective	By acquiring skills in the use of communication techniques the students will be able to express better, grow personally and professionally, develop poise and confidence and achieve success.
6	Course Outcomes	CO1: **Knowledge:** defining, listing and recognising nutrients require for human eye. CO2: understanding, characterising, explaining, identifying and locating the nutrients require for human eye. CO3: performing, demonstrating, implementing and applying the concept

		of biochemistry in better understanding the relevance to the nutrients require for human eye. CO4: analyzing, categorising, comparing and differentiating the nutrients require for human eye.	
7	Course Description	This course deals with essential functional English aspects and nuances of communication skills essential for health care professionals.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Communication**	
	A	• Communication process and Elements of communication	CO1, CO2
	B	• Barriers of communication and how to overcome them	CO3,CO4
	C	• Nuances for communicating with patients and their attendees in hospital	CO1,CO2
	Unit 2	**Speaking**	
	A	• Importance of speaking efficiently, Voice culture, Preparation of speech	CO2,CO4
	B	• Secrets of good delivery, Audience psychology, handling	CO1, CO3
	C	• Presentation skills, Conference/ Interview technique	CO1,CO3
	Unit 3	**Listening**	
	A	• Importance of listening, Self-assessment	CO2,CO4
	B	• Action-plan-execution, Barriers in listening	CO1,CO3
	C	• Good and persuasive listening	CO1,CO2
	Unit 4	**Reading**	
	A	• What is efficient and fast reading	CO2
	B	• Awareness of existing reading habits, Tested techniques for improving speed	CO4
	C	• Improving concentration and comprehension through systematic study	CO1,CO3
	Unit 5	**Non-Verbal Communication**	
	A	• Basics of non-verbal communication	CO1,CO3
	B	• Rapport building skills using neuro-linguistic	CO2

		programming (NLP)			
	C	• Communication in Optometry practice			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• Gwen Van Servellen: Communication for Health care professionals; Concepts, practice and evidence, Jones & Bartlett Publications, USA, 2009			
	Other References	As recommended by the Faculty			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 4th**	
1	Course Code	BOP211	
2	Course Title	Applied Optics-II	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about lenses, prisms, which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect. In addition deals with role of optometrists in optical set-up.	
8	Outline syllabus		CO Mapping
	Unit 1	**Spectacle Lenses - II**	
	A	Manufacture of glass; Lens materials; Lens surfacing; Principle of surface generation and glass cements	CO1, CO2
	B	Terminology used in Lens workshop; Lens properties;	CO3,CO4

		Faults in lens material; Faults on lens surface	
	C	Lens quality; Methods of Inspecting the quality of lenses; Safety standards for ophthalmic lenses (FDA, ANSI, ISI, Others)	CO1,CO2
	Unit 2	**Spectacle Frames**	
	A	Types and parts; Classification of spectacle frames-material, weight, temple position, Coloration	CO2,CO4
	B	Frame construction; Frame selection	CO1, CO3
	C	Size, shape, mounting and field of view of ophthalmic lenses	CO1,CO3
	Unit 3	**Tinted & Protective Lenses**	
	A	Characteristics of tinted lenses Absorptive Glasses; Polarizing Filters	CO2,CO4
	B	Photochromic & Reflecting filters	CO1,CO3
	C	Safety lenses-Toughened lenses, Laminated Lenses, CR 39, Polycarbonate lenses	CO1,CO2
	Unit 4	**Multifocal Lenses; Reflection from spectacle lens surface & lens coatings**	
	A	Introduction, history and development, types; Bifocal lenses, Trifocal & Progressive addition lenses	CO2
	B	Reflection from spectacle lenses - ghost images - Reflections in bifocals at the dividing line	CO4
	C	Antireflection coating, Mirror coating, Hard Multi Coating [HMC], Hydrophobic coating	CO1,CO3
	Unit 5	**Miscellaneous Spectacle**	
	A	Iseikonic lenses; Spectacle magnifiers	CO1,CO3
	B	Recumbent prisms; Fresnel prism and lenses	CO2
	C	Lenticular &Aspherical lenses; High Refractive index glasses	CO4
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE 30% / 20% / 50%	
	Text book/s*	• Troy Fennin :Clinical Optics,,ButterworthHeinmann • Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1972 • C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann, USA, 1996	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 4th**
1	Course Code	BOP206

2	Course Title	Applied Optics-I(LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about lenses, prisms, which would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for their courses in the next semester.	
8	Outline syllabus		CO Mapping
	Unit 1	**Spectacle lenses-II**	
	A	Identification of different types of spectacle lens material	CO1, CO2
	B	Glazing and edging Hands on	CO3,CO4
	C	Identification of faults in lens material and surface	CO1,CO2
	Unit 2	**Spectacle frame**	
	A	Identification of parts of frame and types of frame	CO2,CO4
	B	Measurement of vertex distance	CO1, CO3
	C	Identification of different types of lens design: spherical, cylindrical and Sphero-cylindrical	CO1,CO3
	Unit 3		
	A	Practical based on Transpositions – Simple, Toric and Spherical equivalent	CO2,CO4
	B	Practical based on Prismatic effect, centration, decent ration and Prentice rule	CO1,CO3
	C	Prismatic effect of Plano-cylinder and Spherocylinder lenses	CO1,CO2
	Unit 4		
	A	Practical based on Spherometer & Sag formula, Edge thickness calculations	CO2
	B	Practical based on Magnification in high plus lenses, Minification in high minus lenses	CO4
	C	A collection of different lens types and frames types	CO1,CO3

		should be done by students.		
	Unit 5			
	A	Project report : lens and spectacle frames available in Indian market		CO1,CO3
	B	Practical based on Measurement of lens power.		CO2
	C	Identification of different lens coating		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	• Troy Fennin :Clinical Optics,,ButterworthHeinmann • Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1972 • C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann, USA, 1996		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 4th**	
1	Course Code	BOP212	
2	Course Title	Visual Optics-II	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	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.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.	
8	Outline syllabus		CO Mapping
	Unit 1	**Accommodation & Presbyopia**	

	A	Far and near point of accommodation; Range and amplitude of accommodation	CO1, CO2
	B	Mechanism of accommodation; Variation of accommodation with age Anomalies of accommodation	CO3,CO4
	C	Presbyopia; Hypermetropia and accommodation	CO1,CO2
	Unit 2	**Convergence**	
	A	Type	CO2,CO4
	B	Measurement and Anomalies	CO1, CO3
	C	Relationship between accommodation and convergence-AC/A ratio	CO1,CO3
	Unit 3	**Objective Refraction (Static & Dynamic)**	
	A	Streak retinoscopy; Principle, Procedure, Difficulties and interpretation of findings	CO2,CO4
	B	Transposition and spherical equivalent; Dynamic retinoscopy various methods	CO1,CO3
	C	Radical retinoscopy and near retinoscopy; Cycloplegic refraction	CO1,CO2
	Unit 4	**Subjective Refraction**	
	A	Principle and fogging	CO2
	B	Fixed astigmatic dial(Clock dial),Combination of fixed and rotator dial(Fan and block test),J.C.C	CO4
	C	Duochrome test o Binocular balancing- alternate occlusion, prism dissociation, dissociate Duochrome balance, Borish dissociated fogging o Binocular refraction-Various techniques	CO1,CO3
	Unit 5	**Effective Power &Magnification**	
	A	Ocular refraction vs. Spectacle refraction • Spectacle magnification vs. Relative spectacle magnification •	CO1,CO3
	B	Axial vs. Refractive ammetropia, Knapp's law • Ocular accommodation vs. Spectacle accommodation	CO2
	C	Retinal image blur-Depth of focus and depth of field	CO4
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	• A H Tunnacliffe: Visual optics, The Association of British Optician, 1987 • AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 4th**
1	Course Code	BOP260
2	Course Title	Visual Optics-II (LAB)
3	Credits	1
4	Contact Hours	2

	(P)		
	Course Type	Compulsory	
5	Course Objective	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.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Practice of Retinoscopy- Dry & Wet	CO1, CO2
	B	Cases of myopia, Hypermetropia	CO3,CO4
	C	Cases of Simple myopic/hypermetropic astigmatism, compound myopic/ hypermetropic astigmatism , mixed astigmatism	CO1,CO2
	Unit 2		
	A	Practice of Refractometer, keratometry	CO2,CO4
	B	Determining best vision sphere	CO1, CO3
	C	Near correction	CO1,CO3
	Unit 3		
	A	Practice of subjective refraction –Duochrome, Astigmatic fan	CO2,CO4
	B	Binocular balancing	CO1,CO3
	C	Data collection of various refractive errors in O.P.D. Procedure	CO1,CO2
	Unit 4		
	A	Cases of axial & refractive Anisometropia	CO2
	B	Patient data on (Auto Refractometer Vs subjective refraction)	CO4
	C	Calculation of AC/A ratio – Heterophoria /Gradient Method	CO1,CO3
	Unit 5		
	A	Measurement of NPA and NPC	CO1,CO3
	B	Case study on Pseudomyopia	CO2
	C	Identification of difficulties in retinoscopy	CO4

	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	A H Tunnacliffe: Visual optics, The Association of British Optician, 1987 AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 4th**	
1	Course Code	BOP215	
2	Course Title	Ocular Disease-II	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	Knowledge on 1. Etiology 2. Epidemiology 3. Symptoms 4. Signs 5. Course sequelae of ocular disease 6. Diagnostic approach, and 7. Management of the ocular diseases.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the diseases of anterior segment of human eye. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the various diseases of the human eye. **CO3: Application:** performing, demonstrating, implementing and applying the concept of prognosis and pathophysiology of different ocular diseases which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of diseases.	
7	Course Description	This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases.	
8	Outline syllabus		CO Mapping
	Unit 1	**Retina and Vitreous:**	
	A	Applied Anatomy; Congenital and Developmental Disorders (Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery)	CO1, CO2
	B	Inflammatory disorders (Retinitis : Acute purulent , Bacterial, Virus, mycotic); Retinal Vasculitis (Eales's); Retinal Artery Occlusion (Central retinal Artery occlusion); Retinal Vein occlusion (Ischaemic, Non Ischaemic , Branch retinal vein occlusion)	CO3,CO4
	C	Retinal degenerations : Retinitis Pigmentosa, Lattice degenerations; Macular disorders: Solar retinopathy, central serous retinopathy, cystoid macular oedema, Age	CO1,CO2

		related macular degeneration; Retinal Detachment: Rhegmatogenous, Tractional, Exudative); Retinoblastoma; Diabetic retinopathy; Lasers in Ophthalmology	
	Unit 2	**Ocular Injuries:**	
	A	Terminology : Closed globe injury (contusion, lamellar laceration) Open globe injury (rupture, laceration, penetrating injury, peforating injury)	CO2,CO4
	B	Mechanical injuries (Extraocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis)	CO1, CO3
	C	Non Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational); Clinical approach towards ocular injury patients	CO1,CO3
	Unit 3	**Lens**	
	A	Applied Anatomy and Physiology; Clinical examination; Classification of cataract; Congenital and Developmental cataract; Acquired (Senile, Traumatic, Complicated, Metabolic, Electric, Radiational, Toxic);	CO2,CO4
	B	Morphological: Capsular, Subcapsular, Cortical, Supranuclear, Nuclear, Polar; Management of cataract; Complications of cataract surgery	CO1,CO3
	C	Displacement of lens: Subluxation, Displacement; Lens coloboma, Lenticonus, Microsperophakia.	CO1,CO2
	Unit 4	**Clinical Neuro-ophthalmology**	
	A	Anatomy of visual pathway; Lesions of the visual pathway; Pupillary reflexes and abnormalities (Amaurotic light reflex, Efferent pathway defect, Wernicke's hemianopic pupil, Marcus gunn pupil. Argyll Robetson pupil, Adie's tonic pupil)	CO2
	B	Optic neuritis, Anterior Ischemic optic neuropathy, Pappilloedema, optic atrophy	CO4
	C	Cortical blindness; Malingering; Nystagmus; Clinical examination	CO1,CO3
	Unit 5	**Glaucoma**	
	A	Applied anatomy and physiology of anterior segment; Clinical Examination; Definitions and classification of glaucoma; Pathogenesis of glaucomatous ocular damage; Congenital glaucomas	CO1,CO3
	B	Primary open angle glaucoma; Primary angle closure glaucoma (Primary angle closure suspect, Intermittent glaucoma, acute congestive, chronic angle closure)	CO2
	C	Ocular hypertension; Normal Tension Glaucoma Secondary Glaucomas;	CO4

		Management : common medications, laser intervention and surgical techniques; Glaucoma investigations and procedures: GTX,HRT,Provocative test			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 4th**	
1	Course Code	BOP213	
2	Course Title	Basic Pharmacology	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	Basic principle of pharmacokinetics & Pharmacodynamics Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the ophthalmic drugs. **CO:2 Comprehension:** understanding, characterising, explaining, identifying and locating the various ophthalmic drugs that are useful in treatment and management of ocular diseases. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of ocular or systematic diseases. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of ophthalmic drugs.	
7	Course Description	This course covers the actions, uses, adverse effects and mode of administration of drugs, especially related to eyes.	
8	Outline syllabus		CO Mapping
	Unit 1	**General Pharmacology**	
	A	Mechanisms or drug action	CO1, CO2
	B	Dose–response relationship	CO3,CO4
	C	Pharmacokinetics of drug absorption, distribution, bio-transformation, excretion and toxicity, Factors influencing drug metabolism of drug action	CO1,CO2
	Unit 2	**Action of Specific Agents**	
	A	Depressants; Anti-coagulants	CO2,CO4
	B	Diuretics and hypertensive agent	CO1, CO3
	C	Histamines and anti histamines; Serotonin; Prostaglandins	CO1,CO3

	Unit 3	**Principles of ocular pharmacology**			
	A	Preparation and packing of ophthalmic drugs; General principles of ocular pharmacology; Drug action and effectiveness			CO2,CO4
	B	Drug safety; Factors influencing the objectively demonstrated response; Ocular penetration			CO1,CO3
	C	Routes of general and ocular drug administration			CO1,CO2
	Unit 4	**Optometric Diagnostic Drugs**			
	A	Optometric use of pharmaceuticals, Classification of drug used: Topical ophthalmic drugs, References and drug indices, Surface active drugs, Topical anaesthetics			CO2
	B	Principles and classification of autonomic drugs: Sympathomimetics, Sympatholytics, Parasympathomimetics. Diagnostic use of autonomic drugs			CO4
	C	**Other drug of optometric interest**: Physical agents, Germicides and sterilizing agents, Over –the counter drugs; Dyes and stains			CO1,CO3
	Unit 5	**Preperation of ophthalmic drugs (**Ophthalmic drugs)			
	A	Anti glaucoma; Sulphonamides			CO1,CO3
	B	Antibiotics; Corticosteroids			CO2
	C	Anesthetics; Proteolytic enzymes			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	K D TRIPATHI: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004 Ashok Garg: Manual of Ocular Therapeutics, Jaypee, NewDelhi, 1996 Essentials of Medical Pharmacology by Tripathi Pharmacology &Pharmacotherapeutics by R. S. Satoskar Essentials of Pharmacotherapeutics by F. S. K. Barar			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 4th**
1	Course Code	BOP261
2	Course Title	Basic Pharmacology LAB
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	Basic principle of pharmacokinetics & Pharmacodynamics Commonly used ocular drugs, mechanism, indications, contraindications, drug dosage and adverse effects.
6	Course	**CO1: Knowledge:** defining, listing and recognising the ophthalmic drugs.

	Outcomes	**CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the various ophthalmic drugs that are useful in treatment and management of ocular diseases. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic pharmacology which help in appropriate diagnosis and treatment of ocular or systematic diseases. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of ophthalmic drugs.	
7	Course Description	This course covers the actions, uses, adverse effects and mode of administration of drugs, especially related to eyes.	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based on General Pharmacology**	
	A	• Mechanisms or drug action	CO1, CO2
	B	• Dose–response relationship	CO3,CO4
	C	• Pharmacokinetics of drug absorption, distribution, bio-transformation, excretion and toxicity, Factors influencing drug metabolism of drug action	CO1,CO2
	Unit 2	**Practical based on Action of Specific Agents**	
	A	• Depressants; Anti-coagulants	CO2,CO4
	B	• Diuretics and hypertensive agent	CO1, CO3
	C	• Histamines and anti histamines; Serotonin; Prostaglandins	CO1,CO3
	Unit 3	**Practical based on Principles of ocular pharmacology**	
	A	• Preparation and packing of ophthalmic drugs; General principles of ocular pharmacology; Drug action and effectiveness	CO2,CO4
	B	• Drug safety; Factors influencing the objectively demonstrated response; Ocular penetration	CO1,CO3
	C	• Routes of general and ocular drug administration	CO1,CO2
	Unit 4	**Practical based on Optometric Diagnostic Drugs**	
	A	• Optometric use of pharmaceuticals, Classification of drug used: Topical ophthalmic drugs, References and drug indices, Surface active drugs, Topical anaesthetics	CO2
	B	• Principles and classification of autonomic drugs: Sympathomimetics, Sympatholytics, Parasympathomimetics. Diagnostic use of autonomic drugs	CO4
	C	• **Other drug of optometric interest**: Physical agents, Germicides and sterilizing agents, Over –the counter drugs; Dyes and stains	CO1,CO3
	Unit 5	**Practical based on Preperation of ophthalmic drugs**	
	A	• Anti glaucoma; Sulphonamides	CO1,CO3
	B	• Antibiotics; Corticosteroids	CO2
	C	• Anesthetics; Proteolytic enzymes	CO4
	Mode of examination	Practical	

	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	• K D TRIPATHI: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004 • Ashok Garg: Manual of Ocular Therapeutics, Jaypee, NewDelhi, 1996 Essentials of Medical Pharmacology by Tripathi • Pharmacology &Pharmacotherapeutics by R. S. Satoskar • Essentials of Pharmacotherapeutics by F. S. K. Barar		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 4th**	
1	Course Code	BOP214	
2	Course Title	Optometric Instruments	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts of Optometric Instruments that would lay the foundation for their courses in the next semester.	
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye	
7	Course Description	This course covers commonly used optometric instruments, its basic principle, description and usage in clinical practice	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Trial Set Lenses	CO1, CO2
	B	Phoropters	CO3,CO4
	C	Visual Acuity Checking instruments	CO1,CO2
	Unit 2		
	A	Retinoscope and Auto Refractometer	CO2,CO4
	B	Lensometer	CO1, CO3
	C	Slit Lamp Biomicroscope and Gonioscope	CO1,CO3
	Unit 3		
	A	Tonometer	CO2,CO4

	B	Perimeter			CO1,CO3
	C	Ophthalmoscope			CO1,CO2
	Unit 4				
	A	Corneal topography, Aberrometry			CO2
	B	Keratometer			CO4
	C	Electrodiagnostic instrument (ERG,VEP,EOG)			CO1,CO3
	Unit 5				
	A	Orthoptic Instruments(Synaptophore)			CO1,CO3
	B	Ultrasonography			CO2
	C	Ocular Imaging			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• P R Yoder**:** Mounting Optics in Optical Instruments, SPIE Society of Photo-Optical Instrumentation, 2002 • G Smith**,** D A. Atchison**:** The Eye and Visual Optical Instruments, Cambridge University Press, 1997			
	Other References	• David Henson: Optometric Instrumentations, Butterworth- Heinnemann, UK, 1991			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 4th**
1	Course Code	BOP262
2	Course Title	Optometric Instruments LAB
3	Credits	1
4	Contact Hours (L)	2
	Course Type	Compulsory
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts of Optometric Instruments that would lay the foundation for their courses in the next semester.
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye

7	Course Description	This course covers commonly used optometric instruments, its basic principle, description and usage in clinical practice	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based on following:**	
	A	Trial Set Lenses	CO1, CO2
	B	Visual Acuity Checking instruments	CO3,CO4
	C	Retinoscope	CO1,CO2
	Unit 2	**Practical based on following:**	
	A	Auto Refractometer	CO2,CO4
	B	Lensometer	CO1, CO3
	C	Slit-lamp	CO1,CO3
	Unit 3	**Practical based on following:**	
	A	Tonometer (Schiotz and Applanation)	CO2,CO4
	B	Perimeter	CO1,CO3
	C	Direct Ophthalmoscope	CO1,CO2
	Unit 4	**Practical based on following:**	
	A	Gonioscope	CO2
	B	Keratometer	CO4
	C	Corneal topography	CO1,CO3
	Unit 5	**Practical based on following:**	
	A	Synaptophore	CO1,CO3
	B	A-scan Ultrasonography	CO2
	C	Ocular Imaging (OCT, FFA)	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• P R Yoder**:** Mounting Optics in Optical Instruments, SPIE Society of Photo-Optical Instrumentation, 2002 • G Smith**,** D A. Atchison**:** The Eye and Visual Optical Instruments, Cambridge University Press, 1997	
	Other References	David Henson: Optometric Instrumentations, Butterworth- Heinnemann, UK, 1991	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 4th**
1	Course Code	BOP004

2	Course Title	Clinics-II		
3	Credits	2		
4	Contact Hours (P)	4		
	Course Type	Compulsory		
5	Course Objective	At the end of the course the students will be equipped with the basics knowledge about certain concepts that would lay the foundation for their courses in the next semester.		
6	Course Outcomes	CO1:**Knowledge:** defining, listing and recognising the optics of human eye. CO2:understanding, characterising, explaining, identifying and locating the optics of human eye. CO3:performing, demonstrating, implementing and applying the concept of optics in better understanding the relevance to the optics of human eye. CO4:analysing, categorising, comparing and differentiating the optics of human eye		
7	Course Description	At the end of the course the students will be equipped with the basics knowledge about certain concepts, which would lay the foundation for their courses in the next semester.		
8	Outline syllabus			CO Mapping
	Unit 1	**5 cases each of**		
	A	Slitlampbiomicroscopy		CO1, CO2
	B	Direct Ophthalmoscopy,		CO3,CO4
	C	Indirect ophthalmoscopy		CO1,CO2
	Unit 2	**5cases each of**		
	A	Digital pressure		CO2,CO4
	B	Schiotz Tonometry		CO1, CO3
	C	Applanation Tonometry		CO1,CO3
	Unit 3	**5 cases each of**		
	A	Non-contact tonometry		CO2,CO4
	B	Gonioscopy		CO1,CO3
	C	Corneal Sensitivity		CO1,CO2
	Unit 4	**5 cases each of**		
	A	HVID		CO2
	B	Keratometry		CO4
	C	VVID		CO1,CO3
	Unit 5	**5 cases each of**		
	A	Saccades		CO1,CO3
	B	Pursuits		CO2
	C	Fundus examination by slit lamp biomicroscopy		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	P R Yoder**:** Mounting Optics in Optical Instruments, SPIE		

		Society of Photo-Optical Instrumentation, 2002 G Smith**,** D A. Atchison**:** The Eye and Visual Optical Instruments, Cambridge University Press, 1997	
	Other References	David Henson: Optometric Instrumentations, Butterworth- Heinnemann, UK, 1991	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 5th**	
1	Course Code	BOP310	
2	Course Title	Contact Lens-I	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	Understand the basics of contact lenses; List the important properties of contact lenses; Finalise the CL design for various kinds' patients; Recognize various types of fitting; Explain all the procedures to patient; Identify and manage the adverse effects of contact lens	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of contact lens. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the contact lens in therapeutic and diagnostic use in different ocular condition. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of using contact lenses to treat and manage the ocular abnormalities. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of contact lenses and fitting criteria.	
7	Course Description	The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Introduction to Contact lenses; Definition; Classification / Types; History of Contact Lenses	CO1, CO2
	B	Optics of Contact Lenses: Magnification & Visual field; Accommodation & Convergence; Back & Front Vertex Power / Vertex distance calculation	CO3,CO4
	C	Review of Anatomy & Physiology of: Tear film; Cornea; Lids & Conjunctiva	CO1,CO2
	Unit 2		
	A	Introduction to CL materials: Monomers; Polymers	CO2,CO4
	B	Properties of CL materials: Physiological (Dk, Ionicity, Water content); Physical (Elasticity, Tensile strength, Rigidity); Optical (Transmission, Refractive index)	CO1, CO3
	C	Indications and contraindications; Parameters / Designs of Contact Lenses & Terminology	CO1,CO3
	Unit 3		

	A	RGP Contact Lens materials; Manufacturing Rigid and Soft Contact Lenses – various methods			CO2,CO4
	B	Pre-Fitting examination – steps, significance, recording of results; Correction of Astigmatism with RGP lens			CO1,CO3
	C	Types of fit – Steep, Flat, Optimum – on spherical cornea with spherical lenses			CO1,CO2
	Unit 4				
	A	Types of fit – Steep, Flat, Optimum – on Toric cornea with spherical lenses			CO2
	B	Calculation and finalising Contact lens parameters; Ordering Rigid Contact Lenses – writing a prescription to the Laboratory			CO4
	C	Checking and verifying Contact lenses from Laboratory; Modifications possible with Rigid lenses			CO1,CO3
	Unit 5				
	A	Common Handling Instructions: Insertion & Removal Techniques; Do's and Dont's			CO1,CO3
	B	Care and Maintenance of Rigid lenses: Cleaning agents & Importance; Rinsing agents & Importance; Disinfecting agents & importance; Lubricating & Enzymatic cleaners			CO2
	C	Follow up visit examination; Complications of RGP lenses			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• IACLE modules 1 – 5; CLAO Volumes 1, 2, 3 • Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006 • Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004 • E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008; Contact lens Primer :Jaypee Bros : Monica Chaudhry			
	Other References	• Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 5th**
1	Course Code	BOP355
2	Course Title	Contact Lens-I (LAB)

3	Credits	1		
4	Contact Hours (P)	2		
	Course Type	Compulsory		
5	Course Objective	Understand the basics of contact lenses; List the important properties of contact lenses; Finalise the CL design for various kinds' patients; Recognize various types of fitting; Explain all the procedures to patient; Identify and manage the adverse effects of contact lens		
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of contact lens. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the contact lens in therapeutic and diagnostic use in different ocular condition. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of using contact lenses to treat and manage the ocular abnormalities. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of contact lenses and fitting criteria.		
7	Course Description	The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.		
8	Outline syllabus			CO Mapping
	Unit 1			
	A	History Taking role plays		CO1, CO2
	B	Measurement of Ocular dimensions;		CO3,CO4
	C	Pupillary diameter and lid characteristics; Blink rate and TBUT		CO1,CO2
	Unit 2			
	A	Schrimers test, Slit lamp examination of tear layer		CO2,CO4
	B	Keratometry; Placido's disc		CO1, CO3
	C	Soft Contact Lens fitting – Aspherical		CO1,CO3
	Unit 3			
	A	Soft Contact Lens fitting – Lathecut lenses; Soft Contact Lens over refraction		CO2,CO4
	B	Lens insertion and removal		CO1,CO3
	C	Lens handling and cleaning		CO1,CO2
	Unit 4			
	A	Examination of old soft Lens		CO2
	B	RGP Lens fitting; RGP Lens Fit Assessment and fluorescein pattern		CO4
	C	Special RGP fitting (Aphakia, pseudo phakia & Keratoconus)		CO1,CO3
	Unit 5			
	A	RGP over refraction and Lens flexure		CO1,CO3
	B	Examination of old RGP Lens; RGP Lens parameters		CO2
	C	Slit lamp examination of Contact Lens wearers		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	

	Text book/s*	• IACLE modules 1 - 5 □ CLAO Volumes 1, 2, 3 • Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006 • Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004 • E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008 □ Contact lens Primer :Jaypee Bros : Monica Chaudhry	
	Other References	• Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 5th**	
1	Course Code	BOP311	
2	Course Title	Low Vision and Rehabilitation	
3	Credits	4	
4	Contact Hours (L+T)	3+1	
	Course Type	Compulsory	
5	Course Objective	Definition and epidemiology of Low Vision 2. Clinical examination of Low vision subjects 3. Optical, Non-Optical, Electronic, and Assistive devices. 4. Training for Low Vision subjects with Low vision devices 5. Referrals and follow-up	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of low vision aids. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the use of low vision aids and rehabilitation. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of optics in management of low vision patients. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of low vision aids and rehabilitation techniques.	
7	Course Description	This course deal with the definition of low vision, epidemiology aspect of visual impairment, types of low vision devices and its optical principles, clinical approach of the low vision patients, assistive devices for totally visually challenged, art of prescribing low vision devices and training the low vision patients and other rehabilitation measures.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Definitions & classification of Low vision	CO1, CO2
	B	Epidemiology of low vision [magnitude]	CO3,CO4
	C	Pre-clinical evaluation of low vision patients ,functional	CO1,CO2

		needs assessment, prognostic & psychological factors; psycho-social impact of low vision			
	Unit 2				
	A	Types of low vision aids – optical aids, non-optical aids & electronic devices			CO2,CO4
	B	Assistive technology devices			CO1, CO3
	C	Optics of low vision aids			CO1,CO3
	Unit 3				
	A	Clinical evaluation – assessment of visual acuity, visual field			CO2,CO4
	B	Selection of low vision aids, instruction & training			CO1,CO3
	C	Pediatric Low Vision care			CO1,CO2
	Unit 4				
	A	Low vision aids – dispensing & prescribing aspects			CO2
	B	Visual rehabilitation & counseling			CO4
	C	Legal aspects of Low vision in India; Eye Disorders & Low vision			CO1,CO3
	Unit 5	**Rehabilitation**			
	A	Model of Low Vision services in India			CO1,CO3
	B	Introduction to Optometry rehabilitation Practice			CO2
	C	Clinical Case Presentation			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, ButterworthHeinemann, 1998 • Low vision : jaypee Bros : Monica Chaudhry • E Vaithilingam: practice of Low vision – A guide book, Medical Research Foundation, 2000.			
	Other References	• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999 • Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991 □ A J Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 5th**
1	Course Code	BOP356
2	Course Title	Low Vision and Rehabilitation (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory

5	Course Objective	Definition and epidemiology of Low Vision 2. Clinical examination of Low vision subjects 3. Optical, Non-Optical, Electronic, and Assistive devices. 4. Training for Low Vision subjects with Low vision devices 5. Referrals and follow-up	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of low vision aids. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the use of low vision aids and rehabilitation. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of optics in management of low vision patients. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of low vision aids and rehabilitation techniques.	
7	Course Description	This course deal with the definition of low vision, epidemiology aspect of visual impairment, types of low vision devices and its optical principles, clinical approach of the low vision patients, assistive devices for totally visually challenged, art of prescribing low vision devices and training the low vision patients and other rehabilitation measures.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Attending a low vision care clinic	CO1, CO2
	B	History taking of low vision patient	CO3,CO4
	C	Determining the type of telescope and its magnification (Direct comparison method & calculated method)	CO1,CO2
	Unit 2		
	A	Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.	CO2,CO4
	B	Inducing visual impairment and prescribing magnification.	CO1, CO3
	C	Evaluation of low vision patient	CO1,CO3
	Unit 3		
	A	Prescribing optical devices [How to use]	CO2,CO4
	B	Prescribing of non-optical devices [how to use them]	CO1,CO3
	C	Prescribing electronic devices [how to use them]	CO1,CO2
	Unit 4		
	A	Determining reading speed with different types of low vision aids with same magnification.	CO2
	B	Determining reading speed with a low vision aid of different magnifications.	CO4
	C	Report on disability networks in India	CO1,CO3
	Unit 5		
	A	Visit to blind school and rehabilitation centers	CO1,CO3
	B	Establishing a low vision in clinic	CO2
	C	Visit to clinics and prepare report on low vision patients	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• Christine Dickinson: Low Vision: Principles and	

		Practice Low vision care, 4th edition, ButterworthHeinemann, 1998 • Low vision : jaypee Bros : Monica Chaudhry • E Vaithilingam: practice of Low vision – A guide book, Medical Research Foundation, 2000.	
	Other References	• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999 • Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991 □ A J Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 5th**	
1	Course Code	BOP312	
2	Course Title	Public Health Community & Occupational Optometry	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	1. Community based eye care in India. 2. Prevalence of various eye diseases 3. Developing Information Education Communication materials on eye and vision care for the benefit of the public 4. Organize health education programmes in the community 5. Vision screening for various eye diseases in the community and for different age groups 1. In visual requirements of jobs; 2. In effects of physical, chemical and other hazards on eye and vision; 3. To identify occupational causes of visual and eye problems; 4. To be able to prescribe suitable corrective lenses and eye protective wear and 5. To set visual requirements, standards for different jobs.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing the main role of optometrist in the community health care profession. **CO2: Comprehension:** understanding, characterising, explaining, identifying those diseases that are the most common reason for worldwide blindness. **CO3: Application:** performing, demonstrating, implementing and applying the management and treatment skills to eradicate avoidable blindness from worldwide population. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of health care programs that can avoid the blindness and visual impairment.	
7	Course Description	Introduction to the foundation and basic sciences of public health optometry with an emphasis on the epidemiology of vision problems especially focused on Indian scenario. Also deals with general aspects of occupational health, Visual demand in various job, task analysing method ,visual standards for various jobs , occupational hazards and remedial aspects through classroom sessions and field visit to the factories.	
8	Outline syllabus		CO Mapping

	Unit 1	**Public Health Optometry**	
	A	Concepts and implementation, Stages of diseases; Dimensions, determinants and indicators of health; Levels of disease prevention and levels of health care patterns	CO1, CO2
	B	Epidemiology of blindness – Defining blindness and visual impairment; Eye in primary health care; Contrasting between Clinical and community health programs	CO3,CO4
	C	Community Eye Care Programs; Community based rehabilitation programs; Nutritional Blindness with reference to Vitamin A deficiency	CO1,CO2
	Unit 2		
	A	Vision 2020: The Right to Sight; Screening for eye diseases; National and International health agencies, NPCB; Role of an optometrist in Public Health	CO2,CO4
	B	Organization and Management of Eye Care Programs – Service Delivery models; Health manpower and planning & Health Economics; Evaluation and assessment of health programmes	CO1, CO3
	C	Optometrists' role in school eye health programmes; Basics of Tele Optometry and its application in Public Health; Information, Education and Communication for Eye Care programs	CO1,CO3
	Unit 3	**Occupational Optometry**	
	A	Introduction to Occupational health, hygiene and safety, international bodies like ILO, WHO, National bodies etc Acts and Rules - Factories Act, WCA, and ESI Act.	CO2,CO4
	B	Electromagnetic Radiation and its effects on Eye;	CO1,CO3
	C	Light – Definitions and units, Sources, advantages and disadvantages, standards; Color – Definition, Color theory, Color coding, Color defects, Color Vision tests	CO1,CO2
	Unit 4		
	A	Occupational hazards and preventive/protective methods	CO2
	B	Task Analysis	CO4
	C	Industrial Vision Screening – Modified clinical method; Industrial Vision test	CO1,CO3
	Unit 5		
	A	Vision Standards – Railways, Roadways, Airlines	CO1,CO3
	B	Visual Display Units	CO2
	C	Contact lens and work	CO4
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE 30% / 20% / 50%	
	Text book/s*	• R V North: Work and the eye, Second edition, Butterworth Heinnemann, 2001	

		• BHVI student notes • GVS Murthy, S K Gupta, D Bachani: The principles and practice of community Ophthalmology, National programme for control of blindness, New Delhi, 2002 • Newcomb RD, Jolley JL : Public Health and Community Optometry, Charles C Thomas Publisher, Illinois, 1980 • Community eye health journals	
	Other References	• G W Good: Occupational Vision Manual available in the following website: www.aoa.org • N.A. Smith:Lighting for Occupational Optometry, HHSC Handbook Series, Safchem Services, 1999 • G Carson, S Doshi, W Harvey:Eye Essentials: Environmental & Occupational Optometry, ButterworthHeinemann, 2008 • The Eye and Sports Medicine Manual/International Academy of Sports Vision • Illinois College of Optometry Sports Vision Manual • International Academy of Sports Vision-Sports Vision Manual	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 5th**
1	Course Code	BOP313
2	Course Title	Binocular Vision-I
3	Credits	4
4	Contact Hours (L+T)	3+1
	Course Type	Compulsory
5	Course Objective	Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extraocular muscles; Provide a detailed explanation of, and differentiate between the etiology, investigation and management of binocular vision anomalies; Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.
6	Course Outcomes	**CO1: Knowledge:** defining, listing the grades of binocular vision. **CO2: Comprehension:** understanding, characterising, explaining, identifying the kind of binocular vision anomalies present in patient eye. **CO3: Application:** performing, demonstrating, implementing and applying the principles of binocular vision in early diagnosis and treatment. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of binocular abnormalities on the basis of symptoms, signs and diagnostic procedure.
7	Course Description	This course provides theoretical aspects of Binocular Vision and its clinical application. It deals with basis of normal binocular vision and space perception, Gross anatomy and physiology of extraocular muscles, various

		binocular vision anomalies, its diagnostic approaches and management.			
8	Outline syllabus				CO Mapping
	Unit 1	**Binocular Vision and Space perception**			
	A	Relative subjective visual direction; Retino motor value; Grades of BSV; SMP and Cyclopean Eye; Correspondence,; Fusion, Diplopia, Retinal rivalry			CO1, CO2
	B	Horopter; Physiological Diplopia and Suppression; Stereopsis, Panum's area, BSV; Stereopsis and monocular clues – significance			CO3,CO4
	C	Egocentric location, clinical applications; Theories of Binocular vision			CO1,CO2
	Unit 2				
	A	Anatomy of Extra Ocular Muscles: Rectii and Obliques, LPS; Innervation & Blood Supply.			CO2,CO4
	B	Physiology of Ocular movements: Center of rotation, Axes of Fick; Action of individual muscle.			CO1, CO3
	C	Laws of ocular motility: Donder's and Listing's law; Sherrington's law; Hering's law			CO1,CO3
	Unit 3				
	A	Uniocular& Binocular movements - fixation, saccadic & pursuits; Version &Vergence; Fixation & field of fixation			CO2,CO4
	B	Near Vision Complex Accommodation 6.1 Definition and mechanism (process); Methods of measurement			CO1,CO3
	C	Stimulus and innervations; Types of accommodation; Anomalies of accommodation – aetiology and management.			CO1,CO2
	Unit 4				
	A	Convergence: Definition and mechanism; Methods of measurement; Types and components of convergence - Tonic, accommodative, fusional, proximal; Anomalies of Convergence – aetiology and management.			CO2
	B	Sensory adaptations: Confusion			CO4
	C	Suppression: Investigations; Management; Blind spot syndrome			CO1,CO3
	Unit 5				
	A	Abnormal Retinal Correspondence: Investigation and management; Blind spot syndrome			CO1,CO3
	B	Eccentric Fixation: Investigation and management			CO2
	C	Amblyopia: Classsification; Aeitiology; Investigation; Management			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Pradeep Sharma: Strabismus simplified,			

		New Delhi, First edition, 1999, Modern publishers. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd Gunter K. Von Noorden: BURIAN- VON NOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company	
	Other References	Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publisher	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 5th**
1	Course Code	BOP357
2	Course Title	Binocular Vision-I (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extraocular muscles; Provide a detailed explanation of, and differentiate between the etiology, investigation and management of binocular vision anomalies; Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.
6	Course Outcomes	**CO1: Knowledge:** defining, listing the grades of binocular vision. **CO2: Comprehension:** understanding, characterising, explaining, identifying the kind of binocular vision anomalies present in patient eye. **CO:3 Application:** performing, demonstrating, implementing and applying the principles of binocular vision in early diagnosis and treatment. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of binocular abnormalities on the basis of symptoms, signs and diagnostic procedure.
7	Course Description	This course provides theoretical aspects of Binocular Vision and its clinical application. It deals with basis of normal binocular vision and space perception, Gross anatomy and physiology of extraocular muscles, various binocular vision anomalies, its diagnostic approaches and management.

8	Outline syllabus			CO Mapping
	Unit 1			
	A	Binocular vision assessment		CO1, CO2
	B	Stereopsis evaluation		CO3,CO4
	C	Measurement of NPC and NPA		CO1,CO2
	Unit 2			
	A	Measurement of AC/A Ratio		CO2,CO4
	B	Convergence insufficiency and management of cases		CO1, CO3
	C	Measurement of convergence		CO1,CO3
	Unit 3			
	A	ARC- case discussion		CO2,CO4
	B	Eccentric fixation –Diagnosis and discussion		CO1,CO3
	C	ARC		CO1,CO2
	Unit 4			
	A	Amblyopia management –case presentation		CO2
	B	Amblyopia management –case presentation		CO4
	C	Amblyopia management –case presentation		CO1,CO3
	Unit 5			
	A	Amblyopia management –case presentation		CO1,CO3
	B	Amblyopia management –case presentation		CO2
	C	Amblyopia management –case presentation		CO4
	Mode of examination	Practical		
	Weightage Distribution	CA	ETE	
		60%	40%	
	Text book/s*	Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd Gunter K. Von Noorden: BURIAN- VON NOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company		
	Other References	Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publisher		

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 5th**	
1	Course Code	BOP314	
2	Course Title	Disease of Eye and Clinical Medicine	
3	Credits	2	
4	Contact Hours (L)	2	
	Course Type	Compulsory	
5	Course Objective	Common Systemic conditions: Definition, diagnostic approach, complications and management options; Ocular findings of the systemic conditions; First Aid knowledge	
6	Course Outcomes	**CO1: Knowledge:** defining, listing the types of systematic diseases. **CO2: Comprehension:** understanding, characterising, explaining the clinical features of different systematic diseases. **CO3: Application:** performing, demonstrating, implementing and applying procedure that can help in early diagnosis and treatment. **CO4: Analysis:** analysing, categorising, comparing and differentiating the concept of clinical medicine in appropriate diagnosis of ocular diseases which may be secondary to any systematic diseases.	
7	Course Description	This course deals with definition, classification, clinical diagnosis, complications and management of various systemic diseases. Its indicated cases ocular manifestations also will be discussed.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Hypertension – Definition, classification, Epidemiology, clinical examination, complications, and management.; Hypertensive retinopathy	CO1, CO2
	B	Diabetes Mellitus – Classification, pathophysiology, clinical presentations, diagnosis, and management, Complications; Diabetic Retinopathy	CO3,CO4
	C	Thyroid Disease - Physiology, testing for thyroid disease, Hyperthyroidism, Hypothroidism, Thyroiditis, Thyroid tumors; Grave's Ophthalmopathy;	CO1,CO2
	Unit 2		
	A	Acquired Heart Disease : Ischemic Heart Disease, Congestive heart failure, Disorders of cardiac rhythm, Ophthalmic considerations	CO2,CO4
	B	Cancer: Incidence; Etiology; Therapy; Ophthalmologic considerations	CO1, CO3
	C	Connective Tissue Disease: Rheumatic arthritis; Systemic lupus erythematosus; Scleroderma; Sjogren syndrome; Behcet's syndrome; Eye and connective tissue disease	CO1,CO3
	Unit 3		
	A	Tuberculosis – Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment	CO2,CO4

		tuberculosis and the eye.			
	B	Herpes virus: Herpes simplex, Varicella Zoster, Cytomegalovirus; Herpes and the eye			CO1,CO3
	C	Hepatitis (Hepatitis A, B, C)			CO1,CO2
	Unit 4				
	A	Acquired Immunodeficiency Syndrome			CO2
	B	Anemia (Diagnosis, clinical evaluation, consequences, Sickle cell disease, treatment, Ophthalmologic considerations)			CO4
	C	Common Tropical Medical Ailments: Malaria; Typhoid; Dengue; Filariases; Onchocerciasis; Leprosy			CO1,CO3
	Unit 5				
	A	Nutritional and Metabolic disorders: Obesity; Hyperlipidaemia; Vitamin A Deficiency; Vitamin D Deficiency; Vitamin E Deficiency; Vitamin K Deficiency; Vitamin B1,B2, Deficiency; Vitamin C Deficiency			CO1,CO3
	B	Myasthenia Gravis; Marfan's Syndrome			CO2
	C	First Aid: General Medical Emergencies; Preoperative precautions in ocular surgeries			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles and Practice of Medicine, Ed. John Macleod, 19th Ed., ELBS/Churchill Livingstone. (PPM), 2002			
	Other References	Basic and clinical Science course: Update on General Medicine, American Academy ofOphthalmology, Section 1, 1999			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 6th**
1	Course Code	BOP315
2	Course Title	Contact Lens-II
3	Credits	4
4	Contact Hours (L+T)	3+1
	Course Type	Compulsory
5	Course Objective	1. Understand the basics of contact lenses 2. List the important properties of contact lenses 3. Finalize the CL design for various kind of patients 4.

		Recognize various types of fitting 5. Explain all the procedures to patient 6. Identify and manage the adverse effects of contact lens	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of contact lens. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the contact lens in therapeutic and diagnostic use in different ocular condition. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of using contact lenses to treat and manage the ocular abnormalities. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of contact lenses and fitting criteria.	
7	Course Description	The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.	
8	Outline syllabus		CO Mapping
	Unit 1	**Prefitting examination**	
	A	Review of Basics	CO1, CO2
	B	Patient Selection; Pre screening for contact lens wear	CO3,CO4
	C	Slit Lamp examination; Assessment of Cornea Assessment of Tear film	CO1,CO2
	Unit 2	**Module II: Contact lens fitting**	
	A	Soft contact lens fitting	CO2,CO4
	B	Soft Toric Contact Lens fitting	CO1, CO3
	C	Rigid Contact lens fitting; Managing the Presbyope	CO1,CO3
	Unit 3	**Module III: Extended wear contact lens**	
	A	Cornea and Oxygen	CO2,CO4
	B	Extended Wear	CO1,CO3
	C	Silicone Hydrogel Lenses	CO1,CO2
	Unit 4	**Module IV: Contact lens care**	
	A	Contact lens After Care	CO2
	B	Contact lens Care System1	CO4
	C	Contact lens Care System2	CO1,CO3
	Unit 5	**Module V: Speciality contact lens**	
	A	Therapeutic and Prosthetic contact lenses	CO1,CO3
	B	Overview of Special considerations for fitting contact lenses	CO2
	C	Business Aspects of Contact lens practice; Setting up a Contact lens clinics	CO4
	Mode of	Theory	

	examination				
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	• IACLE modules 1 - 5 □ CLAO Volumes 1, 2, 3 • Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006 • Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004 • E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008 □ Contact lens Primer :Jaypee Bros : Monica Chaudhry			
	Other References	• Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 6th**	
1	Course Code	BOP358	
2	Course Title	Contact Lens-II (LAB)	
3	Credits	1	
4	Contact Hours (P)	2	
	Course Type	Compulsory	
5	Course Objective	1. Understand the basics of contact lenses 2. List the important properties of contact lenses 3. Finalize the CL design for various kind of patients 4. Recognize various types of fitting 5. Explain all the procedures to patient 6. Identify and manage the adverse effects of contact lens	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising types of contact lens. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the contact lens in therapeutic and diagnostic use in different ocular condition. **CO3: Application:** performing, demonstrating, implementing and applying the concept of basic principles of using contact lenses to treat and manage the ocular abnormalities. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of contact lenses and fitting criteria.	
7	Course Description	The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Pre fitting evaluation	CO1, CO2
	B	SCL insertion & Removal	CO3,CO4

	C	Fitting assessment	CO1,CO2
	Unit 2		
	A	Over refraction	CO2,CO4
	B	Follow-up Examination	CO1, CO3
	C	Toric contact lens fitting and assessment; Cosmetic contact lens fitting and assessment	CO1,CO3
	Unit 3		
	A	Do's and don'ts for contact lenses	CO2,CO4
	B	Care and maintenance	CO1,CO3
	C	Special instructions for silicone hydrogels	CO1,CO2
	Unit 4		
	A	Demonstration for bifocal ,multifocal lenses, scleral lenses, Orthokeratology	CO2
	B	RGP insertion and removal	CO4
	C	Fitting assessment and Fluorescein pattern	CO1,CO3
	Unit 5		
	A	Slit-lamp examination of contact lens wearer	CO1,CO3
	B	Video preparations (components of Practical exam)	CO2
	C	Case Presentations (components of Practical exam)	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	• IACLE modules 1 - 5 □ CLAO Volumes 1, 2, 3 • Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006 • Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004 • E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008 □ Contact lens Primer :Jaypee Bros : Monica Chaudhry	
	Other References	• Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 6th**
1	Course Code	BOP316
2	Course Title	Binocular Vision-II
3	Credits	4
4	Contact Hours (L+T)	3+1
	Course Type	Compulsory

5	Course Objective	To inculcate the student with the knowledge of different types of strabismus its etiology signs and symptoms, necessary investigations and also management. The student on completion of the course should be able to independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision. The student should be able to perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing the grades of binocular vision. **CO2: Comprehension:** understanding, characterising, explaining, identifying the kind of binocular vision anomalies present in patient eye. **CO3: Application:** performing, demonstrating, implementing and applying the principles of binocular vision in early diagnosis and treatment. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of binocular abnormalities on the basis of symptoms, signs and diagnostic procedure.	
7	Course Description	This course deals with understanding of strabismus, its classification, necessary orthoptic investigations, diagnosis and non-surgical management. Along with theoretical knowledge it teaches the clinical aspects and application	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Neuro-muscular anomalies; Classification and etiological factors	CO1, CO2
	B	History – recording and significance	CO3,CO4
	C	Accommodative convergent squint; Classification; Investigation and Management	CO1,CO2
	Unit 2		
	A	Non accommodative Convergent squint: Classification; Investigation and Management	CO2,CO4
	B	Divergent Strabismus: Classification; A& V phenomenon; Investigation and Management	CO1, CO3
	C	Vertical strabismus: Classification; Investigation and Management	CO1,CO3
	Unit 3		
	A	Paralytic Strabismus: Acquired and Congenital; Clinical Characteristics	CO2,CO4
	B	Distinction from comitant and restrictive Squint	CO1,CO3
	C	Investigations: History and symptoms; Head Posture; Diplopia Charting; Hess chart; PBCT; Nine directions; Binocular field of vision	CO1,CO2
	Unit 4		
	A	Amblyopia and Treatment of Amblyopia	CO2
	B	Nystagmus	CO4
	C	Non-surgical Management of Squint	CO1,CO3
	Unit 5	**Restrictive Strabismus**	
	A	Features; Musculo-fascical anomalies; Duane's Retraction	CO1,CO3

		syndrome; Clinical features and management			
	B	Brown's Superior oblique sheath syndrome; Strabismus fixus; Congenital muscle fibrosis			CO2
	C	Surgical management			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd Gunter K. Von Noorden: BURIAN- VON NOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company			
	Other References	Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publisher			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 6th**
1	Course Code	BOP359
2	Course Title	Binocular Vision-II (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	To inculcate the student with the knowledge of different types of strabismus its etiology signs and symptoms, necessary investigations and also management. The student on completion of the course should be able to independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision. The student should be able to perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.
6	Course Outcomes	**CO1: Knowledge:** defining, listing the grades of binocular vision. **CO2: Comprehension:** understanding, characterising, explaining, identifying the kind of binocular vision anomalies present in patient eye. **CO3: Application:** performing, demonstrating, implementing and applying the principles of binocular vision in early diagnosis and

		treatment. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of binocular abnormalities on the basis of symptoms, signs and diagnostic procedure.	
7	Course Description	This course deals with understanding of strabismus, its classification, necessary orthoptic investigations, diagnosis and non-surgical management. Along with theoretical knowledge it teaches the clinical aspects and application	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	History taking –Role play	CO1, CO2
	B	Identification and examination of accommodative convergent squint	CO3,CO4
	C	Identification and examination of non-accommodative convergent squint (in clinic or video)	CO1,CO2
	Unit 2		
	A	Cover Test	CO2,CO4
	B	Ocular motility demonstration and hands on various orthoptic instruments and procedures	CO1, CO3
	C	Case discussion different types of strabismus	CO1,CO3
	Unit 3		
	A	Identification and examination of divergent squint (in clinic or video)	CO2,CO4
	B	Identification and examination of vertical squint (in clinic or video)	CO1,CO3
	C	Identification of different types of paralytic squint	CO1,CO2
	Unit 4		
	A	Identifying comitant and restrictive squint	CO2
	B	Identifying null point in nystagmus	CO4
	C	Case study on amblyopia	CO1,CO3
	Unit 5		
	A	Diplopia charting (documentation)	CO1,CO3
	B	Hess charting (documentation)	CO2
	C	Visit to clinic and record cases	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd Gunter K. Von Noorden: BURIAN- VON NOORDEN'S	

		Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company	
	Other References	Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publisher	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 6th**	
1	Course Code	BOP317	
2	Course Title	Geriatric Optometry	
3	Credits	2	
4	Contact Hours (L+T)	2	
	Course Type	Compulsory	
5	Course Objective	Be able to identify, investigate the age related changes in the eyes; Be able to counsel the elderly; Be able to dispense spectacles with proper instructions; Adequately gained knowledge on common ocular diseases.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing the paediatrics ocular disorders. **CO2: Comprehension:** understanding, characterising, explaining, and identifying the kind of anomalies present in paediatric patient. **CO3: Application:** performing, demonstrating, implementing and applying the principles for early detection, diagnosis and proper management. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of disorder in context of congenital or developmental.	
7	Course Description	This course deals with general and ocular physiological changes of ageing, common geriatric systemic and ocular diseases, clinical approach of geriatric patients, pharmacological aspects of ageing ,and spectacle dispensing aspects in ageing patients.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Structural changes of eye in elderly	CO1, CO2
	B	morphological changes of eye in elderly	CO3,CO4
	C	Physiological changes in eye in the course of aging.	CO1,CO2
	Unit 2		
	A	Introduction to geriatric medicine – epidemiology	CO2,CO4
	B	Need for optometry care	CO1, CO3
	C	Systemic diseases(Hypertension, Atherosclerosis, coronary heart disease, congestive Heart failure, Cerebrovascular disease, Diabetes, COPD)	CO1,CO3

	Unit 3				
	A	Optometric Examination of the Older Adult			CO2,CO4
	B	Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders,			CO1,CO3
	C	Vascular diseases of the eye			CO1,CO2
	Unit 4				
	A	Contact lenses in elderly			CO2
	B	Pharmacological aspects of aging			CO4
	C	Low vision causes, management and rehabilitation in geriatrics.			CO1,CO3
	Unit 5				
	A	Spectacle dispensing in elderly			CO1,CO3
	B	Considerations of spectacle lenses			CO2
	C	Considerations of spectacle frames			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	A.J. ROSSENBLOOM Jr& M.W.MORGAN: Vision and Aging, Butterworth-Heinemann, Missouri, 2007			
	Other References	OP Sharma: Geriatric Care – A textbook of geriatrics and Gerontology, viva books, New Delhi, 2005 VS Natarajan: An update on Geriatrics, SakthiPathipagam, Chennai, 1998 DE Rosenblatt, VS Natarajan: Primer on geriatric Care A clinical approach to the older patient, Printers Castle, Cochin, 2002			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 6th**
1	Course Code	BOP318/ BOP360
2	Course Title	Paediatric Optometry/ Paediatric Optometry (LAB)
3	Credits	3
4	Contact Hours (L+P)	(2+2)
	Course Type	Compulsory
5	Course Objective	Have a knowledge of the principal theories of childhood development, and visual development; Have the ability to take a thorough paediatric history which encompasses the relevant developmental, visual, medical and educational issues
6	Course Outcomes	**CO1: Knowledge:** defining, listing the paediatrics ocular disorders. **CO2: Comprehension:** understanding, characterising, explaining, and

		identifying the kind of anomalies present in paediatric patient. **CO3: Application:** performing, demonstrating, implementing and applying the principles for early detection, diagnosis and proper management. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of disorder in context of congenital or developmental.	
7	Course Description	This course is designed to provide the students adequate knowledge in theoretical and practical aspects of diagnosis, and management of eye conditions related to paediatric population. Also it will inculcate the skill of transferring / communicating the medical information to the attender / patient by the students. The scope of this subject is to train the optometrists to develop a systematic way of dealing with children below 12, so as to implement primary eye care and have better, specialized management of anomalies.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	The Development of Eye and Vision	CO1, CO2
	B	History taking: Paediatric subjects	CO3,CO4
	C	Assessment of visual acuity	CO1,CO2
	Unit 2	**Normal appearance, pathology and structural anomalies**	
	A	Orbit, Eye lids, Lacrimal system; Conjunctiva, Cornea, Sclera	CO2,CO4
	B	Anterior chamber, Uveal tract, Pupil; Lens, vitreous, Fundus; Oculomotor system	CO1, CO3
	C	Refractive Examination	CO1,CO3
	Unit 3		
	A	Determining binocular status	CO2,CO4
	B	Determining sensory motor adaptability	CO1,CO3
	C	Compensatory treatment and remedial therapy for : Myopia, Pseudomyopia, Hyperopia, Astigmatism, Anisometropia, Amblyopia	CO1,CO2
	Unit 4		
	A	Remedial and compensatory treatment of Strabismus and Nystagmus	CO2
	B	Anterior segment dysgenesis: Aniridia, Microphthalmos, Coloboma, Albinism	CO4
	C	Paediatric eye disorders: Cataract, Retinopathy of Prematurity, Retinoblastoma; Neuromuscular conditions (myotonic dystrophy, mitochondrial cytopathy), and Genetics	CO1,CO3
	Unit 5		
	A	Spectacle dispensing for children	CO1,CO3
	B	Paediatric contact lenses	CO2
	C	Low vision assessment in children	CO4
	Mode of examination	Theory/Practical	

	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50% (Theory)	
		60%	-	40% (Practical)	
	Text book/s*	Paediatric Optometry - JEROME ROSNER, Butterworth, London 1982			
	Other References	Paediatric Optometry – William Harvey/ Bernard Gilmartin, Butterworth –Heinemann, 2004			

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 6th**	
1	Course Code	BOP319	
2	Course Title	Dispensing Optometry	
3	Credits	3	
4	Contact Hours (L+T)	2+1	
	Course Type	Compulsory	
5	Course Objective	Frame & lens measurements and selection; Writing spectacle lens order; Facial measurements - Interpupillary distance measurement and measuring heights (single vision, multifocal, progressives); Lens verification and axis marking and fitting of all lens types; Final checking of finished spectacle with frame adjustments; Delivery and follow-up; Troubleshooting complaints and handling patient's questions	
6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the Different types of ophthalmic lenses. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the uses of ophthalmic lenses in different cases. **CO3: Application:** performing, demonstrating, implementing and applying the concept of optics different refractive errors which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of lenses, prisms and their prescribing techniques	
7	Course Description	This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. In addition deals with role of optometrists in optical set-up.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Components of spectacle prescription & interpretation, transposition, Add and near power relation	CO1, CO2
	B	Frame selection –based on spectacle prescription, professional requirements, age group, face shape	CO3,CO4
	C	Measuring Inter-pupillary distance (IPD) for distance	CO1,CO2
	Unit 2		
	A	Measuring Inter-pupillary distance (IPD) for near; bifocal height	CO2,CO4

	B	Lens & Frame markings, Pupillary centers, bifocal heights, Progressive markings & adjustments –facial wrap, pantoscopic tilt			CO1, CO3
	C	Recording and ordering of lenses (power, add, diameter, base, material, type, lens enhancements)			CO1,CO3
	Unit 3				
	A	Neutralization –Hand & lensometer			CO2,CO4
	B	Axis marking, prism marking			CO1,CO3
	C	Faults in spectacles (lens fitting, frame fitting, patients complaints, description, detection and correction			CO1,CO2
	Unit 4				
	A	Final checking & dispensing of spectacles to customers			CO2
	B	Counseling on wearing & maintaining of spectacles, Accessories –Bands, chains, boxes, slevets, cleaners, screwdriver kit			CO4
	C	Spectacle repairs –tools, methods, soldering, riveting, frame adjustments			CO1,CO3
	Unit 5				
	A	Special types of spectacle frames: Monocles; Ptosis crutches; Industrial safety glasses; Welding glasses			CO1,CO3
	B	Frame availability in Indian market			CO2
	C	FAQ's by customers and their ideal answers			CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	The fine art of prescribing glasses , Benjamin Milder, Butterworth Heinemann,			
	Other References	Spectacle frame dispensing: H Obstfeld: Butterworth Heinemann			

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 6th**
1	Course Code	BOP361
2	Course Title	Dispensing Optometry (LAB)
3	Credits	1
4	Contact Hours (P)	2
	Course Type	Compulsory
5	Course Objective	Frame & lens measurements and selection; Writing spectacle lens order; Facial measurements - Interpupillary distance measurement and measuring heights (single vision, multifocal, progressives); Lens verification and axis marking and fitting of all lens types; Final checking of finished spectacle with frame adjustments; Delivery and follow-up; Troubleshooting complaints and handling patient's questions

6	Course Outcomes	**CO1: Knowledge:** defining, listing and recognising the Different types of ophthalmic lenses. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the uses of ophthalmic lenses in different cases. **CO3: Application:** performing, demonstrating, implementing and applying the concept of optics different refractive errors which help in appropriate diagnosis. **CO4: Analysis:** analysing, categorising, comparing and differentiating type of lenses, prisms and their prescribing techniques	
7	Course Description	This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. In addition deals with role of optometrists in optical set-up.	
8	Outline syllabus		CO Mapping
	Unit 1		
	A	Interpretation of a spectacle prescription	CO1, CO2
	B	Transposition	CO3,CO4
	C	Measuring IPD for distance and near	CO1,CO2
	Unit 2		
	A	Marking pupillary centre	CO2,CO4
	B	Marking bifocal height	CO1, CO3
	C	Identifying temporary and permanent markings of PAL	CO1,CO3
	Unit 3		
	A	Documentation of hand neutralization (10 lenses of different types)	CO2,CO4
	B	Measuring power by lensometer (10 lenses)	CO1,CO3
	C	Identifying value and orientation of prism in a lens	CO1,CO2
	Unit 4		
	A	Identifying faults in spectacle frame	CO2
	B	Identifying faults in spectacle lens	CO4
	C	Frame adjustment (Plastic and metal)	CO1,CO3
	Unit 5		
	A	Identifying monocles, ptosis crutches	CO1,CO3
	B	Identifying safety glasses	CO2
	C	Documentation of frames and lens available in Indian market	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA: 60% / ETE: 40%	
	Text book/s*	The fine art of prescribing glasses , Benjamin Milder, Butterworth Heinemann,	
	Other References	Spectacle frame dispensing: H Obstfeld: Butterworth Heinemann	

School: SAHS		**Batch : 2020-2024**	
Program: BOPT		**Current Academic Year: 2020**	
Branch: Optometry		**Semester: 7th**	
1	Course Code	BOP012	
2	Course Title	Clinical Project & Public Health Project	
3	Credits	5	
4	Contact Hours (T)	3	
	Course Type	Compulsory	
5	Course Objective	After completion of this course will led the students to direct and exhibit research and clinical studies independently which will contribute to the advancement of optometry and improve the quality of life.	
6	Course Outcomes	**CO1: Knowledge:** defining, listing types of research methodology and sampling. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the uses types of research methodology and sampling **CO3: Application:** performing, demonstrating, implementing and applying the concept of types of research methodology and sampling. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of research methodology and sampling	
7	Course Description	After completion of this course will led the students to direct and exhibit research and clinical studies independently which will contribute to the advancement of optometry and improve the quality of life.	
8	Outline syllabus		CO Mapping
	Unit 1	**Module I**	
	A	Cover Page: This should contain the title of the project proposal, to whom it is submitted, for which degree, the name of the author, name of the supervisor, year of submission of the project work, name of the University.	CO1, CO2
	B	Acknowledgement: Various organizations and individuals who might have provided assistance /cooperation during the process of carrying out the study.	CO3,CO4
	C	Table of Content: Page-wise listing of the main contents in the report, i.e., different Chapters and its main Sections along with their page numbers.	CO1,CO2
	Unit 2	**Module II**	
	A	Abstract: The body of the report should have summary of the project.	CO2,CO4
	B	Introduction: This will cover the background, rationale/ need / justification, brief review of literature, objectives, methodology (the area of the study, sample, type of study, tools for data collection, inclusion & exclusion criteria and method of analysis), Limitations of the Study, and Planning.	CO1, CO3
	C	Conceptual Framework / National and International	CO1,CO3

		Scenario: (relating to the topic of the Project).	
	Unit 3	**Module III**	
	A	Presentation of Data,Analysis and Findings	CO2,CO4
	B	Conclusion and Recommendations: In this section, the concluding observations based on the main findings and suggestions are to be provided.	CO1,CO3
	C	Bibliography or References: This section will include the list of books and articles which have been used in the project work, and in writing a project report.	CO1,CO2
	Unit 4	**Module IV**	
	A	Annexure: Questionnaires (if any), relevant reports, etc.	CO2
	B	Step I: Selection of the topic for the project	CO4
	C	Step I: Selection of the topic for the project	CO1,CO3
	Unit 5	**Module V:**	
	A	Finalization of the Topic and preparation of Project Proposal in consultation with the Supervisor.	CO1,CO3
	B	Step III: Collection of information and data relating to the topic and analysis of the same.	CO2
	C	Step IV: Writing the report dividing it into suitable chapters Documents are to be attached with the Final Project Report	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA / ETE	
		60% / 40%	
	Text book/s*	Research methodology and project performance	
	Other References	Research methodology and project performance	

School: SAHS		**Batch : 2020-2024**
Program: BOPT		**Current Academic Year: 2020**
Branch: Optometry		**Semester: 8th**
1	Course Code	BOP018
2	Course Title	Clinical Project & Public Health Project
3	Credits	5
4	Contact Hours (T)	3
	Course Type	Compulsory
5	Course Objective	After completion of this course will led the students to direct and exhibit research and clinical studies independently which will contribute to the advancement of optometry and improve the quality of life.
6	Course Outcomes	**CO1: Knowledge:** defining, listing types of research methodology and sampling. **CO2: Comprehension:** understanding, characterising, explaining, identifying and locating the uses types of research methodology and sampling

		CO3: Application: performing, demonstrating, implementing and applying the concept of types of research methodology and sampling. **CO4: Analysis:** analysing, categorising, comparing and differentiating types of research methodology and sampling	
7	Course Description	After completion of this course will led the students to direct and exhibit research and clinical studies independently which will contribute to the advancement of optometry and improve the quality of life.	
8	Outline syllabus		CO Mapping
	Unit 1	**Module I**	
	A	Review of Research methods	CO1, CO2
	B	Identifying research problem	CO3,CO4
	C	Ethical issues in research	CO1,CO2
	Unit 2	**Module II**	
	A	Research design	CO2,CO4
	B	Types of Data	CO1, CO3
	C	Research tools and Data collection methods	CO1,CO3
	Unit 3	**Module III**	
	A	Introduction of Biostatistics	CO2,CO4
	B	Sampling methods; Sample size determination.	CO1,CO3
	C	Statistical significance; Correlation	CO1,CO2
	Unit 4	**Module IV**	
	A	Annexure: Questionnaires (if any), relevant reports, etc.	CO2
	B	Theoretical distributions: Binomial; Normal	CO4
	C	Sampling –necessity of methods and techniques; Chi. Square test (2 x 2)	CO1,CO3
	Unit 5	**Module V:**	
	A	Sample size determination: Statistics –Collection of Data - presentation including classification and diagrammatic representation –frequency distribution; Measures of central tendency; measures of dispersion	CO1,CO3
	B	Collection of information and data relating to the topic and analysis of the same.	CO2
	C	Writing the report dividing it into suitable chapters Documents are to be attached with the Final Project Report	CO4
	Mode of examination	Practical	
	Weightage Distribution	CA / ETE	
		60% / 40%	
	Text book/s*	Research methodology and project performance	
	Other References	Research methodology and project performance	

Clinical Training and internship

Every student who has passed in all the theory and practical examinations of all the six semesters will have to undergo clinical training as internship as per schedule finalised by the School of optometry authorities. Every student should attend his/her training in the associated training centres as per the timings of those centres.

A monthly report and summary of the practical work done by student in that training centre will have to be countersigned by the responsible person from that centre. This report will be part of project to be submitted by every student as per the date schedule notified by school of optometry.

The Regular participation of students in seminars / case presentations is mandatory and aimed to encourage them in learning research and development programs in optometry.

Project Work report:

In the final fourth year of internship and clinical training each student will have to undertake a project work on a topic approved by school of optometry faculty. On completion of the project, the student should submit a report on project work, before the end of year of final qualifying examination.

Each report on the project and field work submitted by each candidate will be evaluated by authorities and declared to be 'Satisfactory' or 'Not Satisfactory'

Procedure for candidate to enter the fourth year of the course of studies:

No candidate shall be permitted to proceed to the fourth year of the course of study i.e. period of internship [clinical training] ,unless he has passed in all the written/practical/clinical examinations conducted during the preceding three years of the course of study and his project or field work report have been declared to be 'satisfactory'.

Signature of HOD