DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

DOW UNIVERSITY OF HEALTH SCIENCES

Course Codes and Content for DOCTOR OF OPTOMETRY

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COURSE CODING SYSTEM

In the course coding system, each course is identified by its own course code comprising of the abbreviation of the course with letters followed by three digits. The course code indicates the course area and the specific course abbreviated in alphabets followed by the level of the course, whether it is a year or a semester course and the placement of the course, respectively.

i. **Letter Code**
This is the first half of the course code consisting of two to three letters that represents the course area followed by 3 to 5 letters indicating the specific course.

ii. **Number Code**
This is the second half of the course code which consists of numbers with three digits.

- **The first digit of the number code signifies the level for which the course is intended:**
  - ✔ Level 1 (i.e. 100 series) - are introductory, function, basic skill type courses
  - ✔ Level 2 (i.e. 200 series) - are intermediate level courses
  - ✔ Level 3 (i.e. 300 series) - are also intermediate to advanced level courses
  - ✔ Level 4 (i.e. 400 series) – are those which involve more advanced study skills often requiring level 1 ,2 and 3 courses as prerequisites.
- **The second digit of the number code signifies whether the course is a year course (i.e. offered in two semesters) or in a single semester:**
  0 for a semester course
  1 for the first part of the two semester course **(i.e. a year course)**
  2 for the second part of the two semester course **(i.e. a year course)**
  If the course is offered in more than two semester, it follow the same rule in coding i.e.
  3 for the third part of the course which is being offered in more than two semester
  4 for the fourth part of the course which is being offered in more than two semester
- **The third digit of the number code signifies the placement of the course in terms of semester**
- **Illustrative Examples: NS-CHEM 201-**a level 2 semester course of Chemistry **(specific course)** from the Natural Sciences **(course area)** is placed in first semester
  BS-BCHEM 202-a level 2 semester course of Biochemistry **(specific course)** from Basic Sciences **(course area)** is placed in second semester

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OD- DISP 415 - a first part of the level 4 year course (i.e. offered in two semesters) of Dispensing optics I **(specific course)** from Doctor of Optometry **(course area)** placed in the fifth semester

OD -DISP 426- a second part of the level 4 year course (i.e. offered in two semesters) of Dispensing optics II **(specific course)** from Doctor of Optometry **(course area)** placed in the Six semester

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List of courses in General Education Cluster

GEC EDUCATION CLUSTER	COURSES	CREDIT HOURS
Arts and Humanities	1	02
Natural Sciences	1	03 (02+01)
Social Sciences	1	02
Functional English	1	03
Expository writing	1	03
Quantitative Reasoning	2	06
Islamic studies or Religious education/Ethics in lieu of Islamic studies only for non-muslim students	1	02
Pakistan Studies	1	02
Application of Information & Communication Technologies (ICT)	1	03 (02+01)
Entrepreneurship	1	02
Civics and community engagement	1	02
Total	**12**	**30**

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COURSE CODES: GENERAL EDUCATION COURSES

Serial No	GEC Education Cluster	Course Name	Codes	Credit Hours
1.	**Arts and Humanities**	History	HIS 102	02
2.	**Natural Sciences**	Chemistry/ Physics	CHEM 201/ PHYS 201	03
3.	**Social Sciences**	Psychology	PSY 102	02
4.	**Functional English**	English Foundation	ENG-F 211	03
5.	**Expository writing**	Expository Writing	ENG-W 323	03
6.	**Quantitative Reasoning**	Mathematics	MATH 212	03
7.	**Quantitative Reasoning**	Biostatics	BSTAT 323	03
8.	**Islamic studies or Religious education/Ethics in lieu of Islamic studies only for non-muslim students**	Islamiat/Ethics	ISL 201/ ETHIC 201	02
9.	**Pakistan**	Pakistan Studies	PAK-STD 202	02
10.	**Application of Information & Communication Technologies (ICT)**	Computer Skills	CS 201	03
11.	**Entrepreneurship**	Entrepreneurial Strategy	ENTP 203	02
12.	**Civics and Community Engagement**	Civics and community engagement	CIVCM 204	02
13.	**Ideology and constitution of Pakistan**	ICP 201	IDEOLOGY AND CONSTITUTION OF PAKISTAN	02
14.	**Understanding of Holy Quran - I / Sociology**	FEHM 212 SOC 212	FEHM UL QURAN - I / **Sociology-I**	01
15.	**Understanding of Holy Quran – II / Sociology**	FEHM 323 SOC 323	FEHM UL QURAN - II / **Sociology-II**	01

	Total	**12**		**34**

COURSE CODES: INTERDISCIPLINARY COURSES

Serial No	Course Name	Codes	Credit Hours
1.	**Anatomy**	ANAT 201	03
2.	**Physiology**	PIO 201	03
3.	**Biochemistry**	BCHEM 202	03
4.	**Pharmacology**	PHARM 202	03
5.	**Microbiology and Infection Control**	MICRO 203	03
6.	FIRST AID AND EMERGENCY CARE	**FAEC 202**	02
Total	**6**		**17**

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COURSE CODES: MAJOR SUBJECTS

Serial No	Codes	Course Name	Credit Hours
1.	OD-PGO 303	PHYSICAL AND GEOMETRICAL OPTICS	03 (3+0)
2.	OD-IOVS 303	INTRODUCTION OF OPTOMETRY AND VISION SCIENCES	03 (3+0)
3.	OD-OAP 303	OCULAR ANATOMY AND PHYSIOLOGY	03 (3+0)
4.	OD-BREF 304	BASIC CLINICAL REFRACTION	03 (3+0)
5.	OD-DISP 314	DISPENSING OPTICS-I	03 (3+0)
6.	OD-OAOI 304	OPHTHALMIC AND OPTICAL INSTRUMENTATION	03 (3+0)
7.	OD-ODS 314	OCULAR DISEASE-I	03 (3+0)
8.	OD-PHYO 304	PHYSIOLOGICAL OPTICS	03 (3+0)
9.	OD-ACREF 405	ADVANCED CLINICAL REFRACTION	03 (2+1)
10.	OD-BOIN 405	BASIC OCULAR INVESTIGATION	03(3+0)
11.	OD-PHAR 405	OCULAR PHARMACOLOGY	03 (3+0)
12.	OD-ODS 425	OCULAR DISEASE-II	03 (3+0)
13.	OD- DISP 425	DISPENSING OPTICS-II	03 (3+0)
14.	OD-PEAD 405	PAEDIATRIC OPTOMETRY	03 (3+0)
15.	OD- BCLEN 406	BASIC CONTACT LENS	03 (3+0)
16.	OD-LOW 416	LOW VISION-I	03 (3+0)
17.	OD-BORTH 406	BASIC ORTHOPICS	03 (3+0)
18.	OD-CSME 406	Communication Skills & Medical Ethics	03 (2+1)
19.	OD-CLIN 416	CLINICAL OPTOMETRY PROCEDURE-I	03 (0+3)
20.	OD-GPATH 406	GENERAL PATHOLOGY	03 (3+0)

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21.	OD- ACLEN 407	ADVANCED CONTACT LENS	03 (3+0)
22.	OD-LOW 427	LOW VISION-II	03 (2+1)
23.	OD-AORT 407	ADVANCED ORTHOPTICS	03 (2+1)
24.	OD-NEURO 417	NEUROLOGICAL EYE DISEASE-I	03(3+0)
25.	OD-CLIN 427	CLINICAL OPTOMETRY PROCEDURE-II	03 (0+3)
26.	OD-OATP 307	OPD AND OT PROCEDURE	03 (0+3)
27.	OD-NEURO 428	NEUROLOGICAL EYE DISEASE-II	03(3+0)
28.	OD-CLOW 408	CLINICAL LOW VISION	03 (0+3)
29.	OD-CORT 408	CLINICAL ORTHOPTICS	03 (0+3)
30.	OD-CLEN 408	CLINICAL CONTACT LENS	03 (0+3)
31.	OD- RMAP 408	RESEARCH METHODS AND PRINCIPLES	03(3+0)
32.	OD-OSM 408	OPTICAL SHOP AND INDUSTRY MANAGEMENT	03 (3+0)
33.	OD-VPAN 519	VISUAL PERCEPTION AND NEUROPHYSIOLOGY-I	03 (3+0)
34.	OD-ACR 519	ADVANCED CLINICAL OPTOMETRY-I	03 (0+3)
35.	OD-ADIS 509	ADVANCED DISPENSING	03 (0+3)
36.	0D-GCO 509	GERIATRIC OPTOMETRY	03 (3+0)
37.	OD-VPAN 620	VISUAL PERCEPTION AND NEUROPHYSIOLOGY-II	03 (3+0)
38.	OD-COPH 600	COMMUNITY OPHTHALMOLOGY	03 (2+1)
39	OD-AOIN 620	ADVANCE OCULAR INVESTIGATION	03 (2+1)
40	OD-ACR 620	ADVANCED CLINICAL OPTOMETRY-II	03(0+3)
TOTAL CREDIT HOURS			120

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UPDATED COURSE PLACEMENTS & CODES

YEAR 1: SEMESTER I

Subject	Course Codes	Semester-I	Credit Hours
Natural Sciences	PHYS 201	PHYSICS	03
Application Of Information & Comm. Technologies	CSAI 201	COMPUTER SCIENCE AND INTEGRATED ARTIFICIAL INTELLIGENCE IN MEDICAL TECHNOLOGY	03 (2-1)
Functional English	ENG-F 211	ENGLISH FOUNDATION	03
Civilization Courses	ISL 201/ ETHIC 201	ISLAMIAT/ETHICS	02
Ideology and constitution of Pakistan	ICP 201	IDEOLOGY AND CONSTITUTION OF PAKISTAN	02
Interdisciplinary Sciences	ANAT 201	ANATOMY	03
	PIO 201	PHYSIOLOGY	03
Total General Education Courses	**13**		
Interdisciplinary Sciences Course	**06**		
Total Credit Hours in Semester	**19**		

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YEAR 1: SEMESTER II

Subject	Course Codes	Semester-II	Credit Hours
Pakistan STUDIES	PAK-STD 202	PAKISTAN STUDIES	02
Social Sciences	PSY 102	PSYCHOLOGY	02
Arts and Humanities	HIS 102/PHIL 102	HISTORY/PHILOSOPHY	02
Quantitative Reasoning	MATH 212	MATHEMATICS	03
Understanding of Holy Quran - I/ Sociology	FEHM 212/ SOC 212	FEHM UL QURAN - I/ **Sociology – I**	01
Interdisciplinary Sciences	FAEC 202	FIRST AID AND EMERGENCY CARE	02
	BCHEM 202	BIOCHEMISTRY	03
	PHARM 202	PHARMACOLOGY	03
Total General Education Courses	**10**		
Interdisciplinary Sciences Course	**08**		
Total Credit Hours in Semester	**18**		

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YEAR- 2: SEMESTER III

Subject	Course Codes	Semester-III	Credit Hours
Quantitative Reasoning	BSTAT 323	BIOSTATISTICS	03
Entrepreneurship	ENTP 203	ENTREPRENEURIAL STRATEGY	02
Expository Writing	ENG-W 323	EXPOSITORY WRITING	03
Understanding of Holy Quran – II / Sociology	FEHM 323 / (SOC 323)	FEHM UL QURAN - II / **Sociology – II**	01
Interdisciplinary Sciences	MICRO 203	MICROBIOLOGY AND INFECTION CONTROL	03
Major Course	OD-PGO 303	PHYSICAL AND GEOMETRICAL OPTICS	03 (3+0)
	OD-OAP 303	OCULAR ANATOMY AND PHYSIOLOGY	03 (3+0)
	OD-IOVS 303	INTRODUCTION OF OPTOMETRY AND VISION SCIENCES	03 (3+0)
Total General Education Courses	**09**		
Interdisciplinary Sciences Course	**03**		
Major Course	**09**		
Total Credit Hours in Semester	**21**		

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YEAR- 2: SEMESTER IV

Subject	Course Codes	Semester-IV	Credit Hours
Civics and community engagement	CIVCM 204	CIVICS AND COMMUNITY ENGAGEMENT	02
Major Course	OD-BREF 304	BASIC CLINICAL REFRACTION	03 (3+0)
	OD-DISP 314	DISPENSING OPTICS-I	03 (3+0)
	OD-OAOI 304	OPHTHALMIC AND OPTICAL INSTRUMENTATION	03 (3+0)
	OD-ODS 314	OCULAR DISEASE-I	03 (3+0)
	OD-PHYO 304	PHYSIOLOGICAL OPTICS	03 (3+0)
Total General Education Courses	**02**		
Major Course	**15**		
Total Credit Hours in Semester	**17**		

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YEAR- 3
3: SEMESTER V

Subject	Course Codes	Semester-V	Credit Hours
Major Course	OD-ACREF 405	ADVANCED CLINICAL REFRACTION	03 (2+1)
	OD-BOIN 405	BASIC OCULAR INVESTIGATION	03(3+0)
	OD-PHAR 405	OCULAR PHARMACOLOGY	03 (3+0)
	OD-ODS 425	OCULAR DISEASE-II	03 (3+0)
	OD- DISP 425	DISPENSING OPTICS-II	03 (3+0)
	OD-PEAD 405	PAEDIATRIC OPTOMETRY	03 (3+0)
Major Course	**18**		
Total Credit Hours in Semester	**18**		

YEAR- 3: SEMESTER VI

Subject	Course Codes	Semester-VI	Credit Hours
Major Course	OD- BCLEN 406	BASIC CONTACT LENS	03 (3+0)
	OD-LOW 416	LOW VISION-I	03 (3+0)
	OD-BORTH 406	BASIC ORTHOPICS	03 (3+0)
	OD-CSME 406	COMMUNICATION SKILLS & MEDICAL ETHICS	03 (2+1)
	OD-GPATH 406	GENERAL PATHOLOGY	03 (3+0)
	OD-CLIN 416	CLINICAL OPTOMETRY PROCEDURE-I	03 (0+3)
Major Course	**18**		
Total Credit Hours in Semester	**18**		

YEAR-4: SEMESTER VII

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Subject	Course Codes	Semester-VII	Credit Hours
Major Course	OD- ACLEN 407	ADVANCED CONTACT LENS	03 (3+0)
	OD-LOW 427	LOW VISION-II	03 (2+1)
	OD-AORT 407	ADVANCED ORTHOPTICS	03 (2+1)
	OD-NEURO 417	NEUROLOGICAL EYE DISEASE-I	03(3+0)
	OD-OATP 407	OPD AND OT PROCEDURE	03 (0+3)
	OD-CLIN 427	CLINICAL OPTOMETRY PROCEDURE-II	03 (0+3)
Major Course	**18**		
Total Credit Hours in Semester	**18**		

YEAR-4: SEMESTER VIII

Subject	Course Codes	Semester-VIII	Credit Hours
Major Course	OD-NEURO 428	NEUROLOGICAL EYE DISEASE-II	03(3+0)
	OD-CLOW 408	CLINICAL LOW VISION	03 (0+3)
	OD-CORT 408	CLINICAL ORTHOPTICS	03 (0+3)
	OD-CLEN 408	CLINICAL CONTACT LENS	03 (0+3)
	OD- RMAP 408	RESEARCH METHODS AND PRINCIPLES	03(3+0)
	OD-OSM 408	OPTICAL SHOP AND INDUSTRY MANAGEMENT	03 (3+0)
Major Course	**18**		
Total Credit Hours in Semester	**18**		

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YEAR-5: SEMESTER IX

Subject	Course Codes	Semester-IX	Credit Hours
Major Course	OD-VPAN 519	VISUAL PERCEPTION AND NEUROPHYSIOLOGY-I	03 (3+0)
	0D-GCO 509	GERIATRIC OPTOMETRY	03 (3+0)
	OD-COPH 509	COMMUNITY OPHTHALMOLOGY	03 (2+1)
	OD-ADIS 509	ADVANCED DISPENSING	03 (0+3)
	OD-ACR 519	ADVANCED CLINICAL OPTOMETRY-I	03 (0+3)
Field experience/ Internship	OD-INTRN 509	INTERNSHIP	03 (0+3)
Field experience/ Internship	**3**		
Major Course	**15**		
Total Credit Hours in Semester	**18**		

YEAR-5: SEMESTER X

Subject	Course Codes	Semester-IX	Credit Hours
Major Course	OD-VPAN 620	VISUAL PERCEPTION AND NEUROPHYSIOLOGY-II	03 (3+0)
	OD-AOIN 620	ADVANCE OCULAR INVESTIGATION	03 (2+1)
	OD-ACR 620	ADVANCED CLINICAL OPTOMETRY-II	03(0+3)
Capstone	OD-CP 600	CAPSTONE PROJECT	06(0+6)
Capstone/Research Project	**6**		
Major Course	**9**		
Total Credit Hours in Semester	**15**		

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15 GEC COURSES = 34 CREDIT HOURS

6 INTERDISCIPLINARY SCIENCES = 17 CREDITS HOURS

1 FIELD EXPERIENCE/ INTERNSHIP = 3 CREDIT HOURS

CAPSTONE = 6 CREDIT HOURS

MAJOR COURSE = 120 CREDIT HOURS

TOTAL = 180 CREDITS HOURS

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SEMESTER III, YEAR II

SYLLABUS

Title: Introduction to optometry and visual science OD-OPTOM 303

Credit hours: 03 (3+0)

Semester: III, YEAR II.

Course Description: This course introduces students to the profession of optometry and the scientific principles underlying vision. It provides foundational knowledge of eye care roles, visual system structure and function, basic optics, and professional ethics, preparing students for advanced clinical and vision science subjects.

Learning Objects:

At the end of this course, the student will be able to:

1. Define optometry and explain its role in the eye-care system.
2. Describe the scope of practice and professional responsibilities of an optometrist.
3. Identify the basic anatomical structures of the eye and their functions.
4. Explain fundamental physiological processes involved in vision.
5. Understand basic optical principles related to image formation in the eye.
6. Describe visual perception and performance concepts.
7. Demonstrate awareness of ethical principles and professional behavior in optometric practice.
8. Understand the relationship between visual science and clinical optometry.
9. Develop foundational scientific terminology for advanced optometry subjects.

Learning Outcomes:

- Students are able to know about the healthcare delivery system at primary, secondary, and tertiary care.

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- To know the origin of the optometry field and the leading cause of vision impairment globally.
- To understand the community participation in the healthcare delivery system.
- Health system in developed countries.
- To understand the responsibilities of an optometrist in health.

Course content:

1. Introduction to Optometry

- Definition and history of optometry
- Evolution of optometry as a profession
- Scope of optometric practice (clinical, diagnostic, rehabilitative)
- Optometry vs ophthalmology vs dispensing optics
- Role of optometrists in hospitals, clinics, and community settings

2. Eye Care Delivery Systems

- Primary, secondary, and tertiary eye care
- Multidisciplinary eye-care team
- Role of optometrists in public health
- Preventive eye care concepts

3. Introduction to Visual Science

- Definition of visual science

- Components of vision: optical, neural, perceptual
- Relationship between eye, brain, and visual perception
- Importance of visual science in clinical optometry

4. Gross Anatomy of the Eye

- Orbit and adnexa (introductory)
- Eyelids, conjunctiva, lacrimal apparatus
- External and internal anatomy of the eyeball
- Coats of the eye: fibrous, vascular, nervous

5. Anatomy of the Retina and Optic Nerve

- Retinal layers (overview)
- Photoreceptors: rods and cones
- Macula and fovea
- Optic nerve head and visual pathway (introductory)

6. Physiology of Vision

- Nature of light perception
- Phototransduction (basic concept)
- Dark and light adaptation
- Color vision (basic theories overview)

- Visual field concept

7. Introduction to Visual Optics

- Nature and properties of light
- Reflection and refraction
- Prisms and lenses (basic)
- Vergence and focal length
- Image formation in the human eye

8. Refractive Status of the Eye (Introductory)

- Emmetropia
- Ametropia: myopia, hyperopia, astigmatism (concept only)
- Presbyopia (introductory)
- Optical correction overview (spectacles, contact lenses)

9. Visual Development and Aging

- Visual development in infancy and childhood
- Critical periods of visual development
- Normal aging changes in vision

10. Clinical Environment Orientation

- Introduction to optometry clinic

- Common ophthalmic instruments (overview)
- Basic infection control and hygiene
- Patient handling and professionalism

11. Professional Ethics in Optometry

- Code of ethics for optometrists
- Patient confidentiality
- Informed consent
- Professional responsibility and accountability

12. Communication Skills

- Patient communication basics
- History taking (introductory)
- Professional interaction with healthcare team

13. Introduction to Research and Evidence-Based Practice

- Scientific thinking in optometry
- Basics of evidence-based eye care
- Importance of research in visual science
- Reading and understanding basic scientific literature

Evaluation Criteria:

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Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended books:

Borish's Clinical Refraction

Clinical Anatomy of the Visual System – Remington

Optometry: Science, Techniques and Clinical Management – Rosenfield & Logan

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Title: OCULAR ANATOMY AND PHYSIOLOGY

Credit Hrs: 03 (3+0)

Placement: YEAR- 2: SEMESTER III

Course Description:

The Ocular Anatomy and Physiology course focuses on the structure and function of the eye and visual system. The course is designed to provide students with an in-depth understanding of the anatomy and physiological processes that underpin vision. The knowledge gained will be foundational for understanding common ocular diseases and disorders and will support clinical practice in optometry, ophthalmology, and vision science.

Learning Objectives:

1. Understanding Ocular Anatomy
2. Physiology of Vision and Light Processing
3. Ocular Muscles and Eye Movements
4. The Visual System and Neural Integration
5. Ocular Fluid Dynamics
6. The Autonomic Nervous System and Ocular Function
7. Anatomy and Physiology of the Ocular Adnexa
8. The Role of Systemic Physiology in Ocular Health
9. Clinical Relevance of Anatomy and Physiology in Optometry

Learning outcomes:

- Identify and Describe Ocular Structures:
- Accurately identify and describe the anatomy of the eye, including both external and internal structures (e.g., cornea, lens, retina, optic nerve).
- Understand the structure and function of the anterior and posterior segments of the eye, including the role of each component in the visual process.
- Understand the Physiology of Vision:
- Demonstrate an understanding of the physiological mechanisms that enable vision, including phototransduction, accommodation, pupillary reflexes, and visual processing.
- Explain the processes involved in the conversion of light into electrical signals by the retina and their transmission through the visual pathway to the brain.
- Explain the Visual Pathway:

- Describe the pathway visual information follows from the retina to the visual cortex, including the roles of the optic nerve, optic chiasm, optic tracts, and lateral geniculate nucleus.
- Understand how the brain processes visual information for perception.
- Analyze the Role of Ocular Components in Vision:
- Explain the function of each ocular structure, such as the cornea in light refraction, the lens in accommodation, and the retina in image formation.
- Understand the relationship between the anatomy of the eye and its ability to perform visual tasks, including focusing, depth perception, and color vision.
- Understand Intraocular Pressure and Fluid Dynamics:
- Explain the mechanisms behind intraocular pressure (IOP), including the role of aqueous humor production, circulation, and drainage in maintaining ocular health.
- Identify how IOP regulation can impact eye diseases like glaucoma.
- Comprehend the Role of the Visual Reflexes:
- Describe and explain the physiological mechanisms behind various ocular reflexes, including the pupillary light reflex, accommodation reflex, and vergence reflex.
- Analyze how these reflexes contribute to maintaining visual clarity and stability during daily tasks.

Course Outline:

Introduction to Ocular Anatomy and Physiology

Orbit

- Anatomy and physiology of orbit.

Extra ocular muscles

- Anatomy of extraocular muscles
- Innervations and actions of extra ocular muscles.

Eyelids

- Anatomy of eyelid
- Function of the eye lids (Conjunctiva)
- Anatomy of conjunctiva
- Function of the conjunctiva (Tear film)
- Anatomy and physiology and functions of tear film.

Cornea

- Physiology of cornea, functions of the cornea.
- Factors responsible for the transparency.

Sclera

- Anatomy and physiology of sclera

Pupil

- Pupil and its function.
- Pupillary light reflex pathway.

Lens and chambers of eye

- Basic physiology of the lens.

Aqueous

- Physiology of aqueous drainage system.

Uveal tract

- Functions of iris and ciliary body.

Lacrimal system

- Anatomy and physiology of lacrimal system

Retina and vitreous

- Detailed anatomy of retina and vitreous
- Physiology of rods
- Physiology of cone
- Vitamin a cycle.
- Physiology of color vision.
- Functions of optic nerve.
- Physiology of vitreous humor.

Visual pathway

- The visual functioning and physiology of the human visual system.
- Physiology of visual pathways.
- Physiology of visual cortex.(brain)

Evaluation Criteria:

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Recommended Reading:

1. **SNELL OCULAR ANATOMY**
2. **FRANK NEWELL**

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Title: Physical and Geometrical optics **CODE OD-PGO 203**

Credit hours: 03 (3+0)

Placement: Semester: III, YEAR II.

Course Description: The study of light and its behavior as it propagates in a variety of media. To give a solid theoretical understanding of geometrical and physical optics. In terms of geometrical optics, the course spans the full range of refractive devices from simple thin lenses to reduced (Gauss) systems and is taught in terms of unifying vergence equations.

Learning Objectives

1. To knowledge about the Nature of light, Theories of light, Wave theory of light and Quantum theory of light
2. To knowledge about the Properties of light and related phenomena
    - Interference
    - Coherence
    - Polarization
    - Diffraction
    - Scattering
3. To knowledge about the spectrum of light and lasers, Lasers (fundamentals)
4. To differentiate between Light spectrum and electromagnetic spectrum
5. To knowledge about the Radiometry & photometry
6. To knowledge about the Reflection of Light, and its Laws of reflection\
7. To knowledge about the Reflection from plane and spherical surfaces
8. To knowledge about the Image formation from spherical surfaces with respect to the different locations
9. To knowledge about the Refraction of Light, its Laws of Refraction, Refractive Index, and Refraction at Plane and Spherical Surfaces.
10. To knowledge about the vergence and surface power reduced vergence and reduced thickness.
11. To knowledge about the Coaxial system of spherical lenses & Critical angle, total internal reflection and prisms, fibre optics
12. Knowledge about the lenses: types, nomenclature, Graphic analysis of lens system, Lens shape and vertex, and effective lens power
13. To knowledge about the thick lens theory, thin lens, back vertex power and equivalent power
14. To knowledge about the photometry and interference
15. To knowledge about the optics of prisms and the following aspects of:

- Refraction by prisms
- The detection and measurement of prisms
- Nomenclature of prisms
- Uses and types of prism in ophthalmology
- Therapeutic
- Diagnostic
- Prentice position and the position of minimum deviation
- Notation of prisms,
- Prism diopter
- Fresnel prisms

Learning outcomes:

At the end of this course, students will be able to have:

- Students are able to understand basic knowledge about how light behaves in nature.
- Students are able to understand how refraction and reflection occur.
- Students are able to identify lenses, draw their optics, and discuss their types and uses.
- Students are able to understand and identify prisms, demonstrate their properties, and know about applications in the field of ophthalmology.
- Students are able to understand how dispersion of light through prism occurs
- Students are able to understand Prism and all necessary about it.
- Students are able to understand the vergence power of the lens.
- Students are able to understand both laws of refraction and reflection.
- Student able to understand both Radiometry & photometry
- Student able to understand Light spectrum and electromagnetic spectrum
- Student able to understand of interference
- Student able to understand to photometry
- Students able to understand Diffraction and polarisation

Contents:

- Nature of light
- Theories of light
- Quantum theory of light
- Properties of light (Interference, Coherence, Polarization, Diffraction and Scattering)
- Spectrum of light and lasers
- Electromagnetic spectrum

- Radiometry & photometry
- Reflection of Light
- Reflection
- Vergence
- Interference
- Diffraction and polarisation
- Spherical lenses
- Critical angle
- Total internal reflection
- Thick lens and thin lens theory
- Back vertex power
- Photometry
- Prisms (Refraction, Nomenclature, Uses and types, Therapeutic, Diagnostic, Prentice position, Notation of prisms, Prism diopter and Fresnel prisms)

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended books:

- **Clinical Optics – American Academy of Ophthalmology**
- **Optics, Refraction & Contact Lenses – AK Khurrana**
- **Clinical Optics – Andrew Elkington**
- **Clinical Visual Optics – Benetts & Reddets**
- **Clinical Optics & Refraction – Andrew William Kerl**

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SEMESTER IV, YEAR II

SYLLABUS

Title: Basic and Clinical Refraction OD-BREF 304

Credit hours: 03 (3+0)

Placement: SEMESTER IV, YEAR II

Course Description: The overall prevalence of blindness around the globe demands well-trained eye care professionals like optometrists. The latest developments in the field of ophthalmology in relation to the new disease condition are the greatest challenges for the optometrists. It has been revealed that there is a strong need to provide structured training for the optometrists. Hence, there needs to be a focus on the basics, which include the basics & clinical refraction. This course will primarily focus on the basic terminologies used in refraction as well as the basic concepts regarding common ophthalmic instruments.

Learning objectives:

1. To know about light and its fundamental properties.
2. To know about the nature of light (theories).
3. To know about the properties of light.
4. To know about Refraction of Light.
5. To know about reflection of light.
6. To know about Dispersion of light
7. To know about lenses and their properties.
8. To know about Prism and all components.
9. To know about basic common Ophthalmic Instruments
10. To know about ophthalmic instruments: Retinoscope, ophthalmoscope, keratometer, and lensometer
11. To know about refractive errors (myopia, hyperopia, and astigmatism).
12. To know about Myopia, Hyperopia and Astigmatism in detail
13. To know about accommodation and its types.
14. To know about Presbyopia and its types.
15. To know about aphakia and complications.
16. To know about Pseudophakia and its clinical features.

Learning Outcomes:

At the end of this course, students will be able to have:

- Basic knowledge about how light behaves in nature.
- How refraction and reflection occur.
- Identify lenses, draw their optics, and discuss their types and uses.

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- Identify the prism, demonstrate its properties, and know about applications in the field of optometry or ophthalmology.
- How dispersion of light through a prism occurs.
- Basics of Refractive Errors, Optics, Types, and Their Basic Management.
- Know the basics of ophthalmic instruments like retinoscope, ophthalmoscope, Keratometer,
- Lensometer etc.
- How to easily handle and care for the daily used ophthalmic instruments.
- How does accommodation occur within the eyes?
- What is presbyopia and its occurrence with age?
- Know about Aphakia and its causes.
- The basics of pseudophakia.

Contents:

- Light and its fundamental properties.
- Nature of light (theories).
- Properties of light.
- Refraction of Light.
- Reflection of light.
- Dispersion of light
- Lenses and their properties.
- Prism and all components.
- Ophthalmic Instruments (Retinoscope, Ophthalmoscope, Keratometer & Lensometer)
- Refractive errors (Myopia, Hyperopia and Astigmatism in detail)
- Color vision test
- Accommodation and its types.
- Presbyopia and its types.
- Aphakia and complications.
- Pseudophakia and its clinical features.
- Near point of accommodation and near point of convergence

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended books

- **Clinical Optics – American Academy of Ophthalmology**
- **Optics, Refraction & Contact Lenses – AK Khurrana**
- **Clinical Optics – Andrew Elkington**
- **Clinical Visual Optics – Benetts & Reddets**
- **Clinical Optics & Refraction – Andrew William Kerl**

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Title: **OCULAR DISEASE-I (OD-ODS 414)**
Credit Hrs: **03 (3+0)**
Placement: **YEAR- 2: SEMESTER IV**

Course Description:

This course is designed for bachelor's students having their first exposure to ocular diseases; contains a comprehensive series of lectures on Eye diseases anterior segments. It introduces the students to Eye diseases, their pathology, characteristics and treatment. This course provides a strong foundation of eye disease & its basic treatment so that it is helpful in future clinics courses.

Course Objectives

By the end of the module the student should be able to:

Learning Objectives (LOs)

1. Identify congenital and acquired eyelid disorders.
2. Describe obstructive lacrimal disorders and differentiate acute vs chronic dacryocystitis.
3. Recognize types of conjunctivitis, trachoma, and ophthalmia neonatorum.
4. Define common corneal diseases and differentiate bacterial, viral, and fungal ulcers.
5. Explain corneal dystrophies, keratoconus, and corneal edema.
6. Differentiate scleritis and episcleritis.
7. Describe cataract, other lens abnormalities, and associated complications.
8. Define and classify uveitis and identify congenital uveal abnormalities.
9. Explain basic management, prevention, and referral guidelines for common ocular diseases.
10. Describe preventive strategies and public-health measures for vision preservation.

Learning Outcomes

After completing this course, students will be able to:

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- Describe common diseases of the eyelids, lacrimal system, conjunctiva, cornea, sclera, lens, and uvea.
- Identify risk factors, causes, and clinical features of common anterior segment eye diseases.
- Differentiate ocular diseases based on clinical presentation.
- Explain basic management, prevention, and referral principles.
- Recognize ocular diseases of public health importance and preventive strategies.

Course Outline:

1. **Diseases of the eyelids**
   a. Congenital diseases
   - Ptosis
   - Distichiasis
   - Entropion
   - Coloboma

   b. Abnormalities of the shape and position of eyelids
   - Entropion
   - Ectropion
   - Ptosis

   c. Disease of the lid margins.
   - Stye
   - Blepharitis
   - Disorders of the eyelashes

   d. Miscellaneous
   - Chalazion

2. **Diseases of the lacrimal system**
   - Obstructive disorders
     - ☐ NLD Block
   - Acute dacrocystitis
   - Chronic dacrocystitis

3. **Diseases of the conjunctiva**
   a. Conjunctivitis
   - General causes, Risk factors and clinical presentation

   b. Bacterial conjunctivitis

- Specific causes, Risk factors, Clinical presentation and Management
- Public health advice & preventive measures

c. Viral conjunctivitis

- Specific causes, Risk factors, Clinical presentation and Management
- Public health advice & preventive measures

d. Allergic and vernal conjunctivitis

- Specific causes, Risk factors, Clinical presentation and Management
- Public health advice & preventive measures

e. Trachoma

- Epidemiology
- Characteristic clinical features, Staging and Complications
- Trachoma blindness and its prevention

f. Ophthalmia Neonatorum

- Etiology, Clinical presentation, Complications, Management and Prevention

g. Common degenerative conditions of the conjunctiva

- List
- Clinical presentation

4. Diseases of the Cornea

a. General terms

- Corneal ulcer
- Corneal abrasion
- Keratitis
- Corneal edema
- Corneal opacity

b. Risk factors for corneal diseases and the microorganisms causing corneal infections.

c. Corneal ulcer.

- General clinical features and management
- Specific clinical features of bacterial corneal ulcers
- Specific clinical features of viral corneal ulcers
- Specific clinical features of fungal corneal ulcers
- Role of primary eye care worker in the management and prevention of corneal ulcers.

d. Xerophthalmia and nutritional corneal ulceration

e. Corneal dystrophies

- Definition
- General presentation

g. Corneal edema

- Causes
- Clinical presentation

h. Keratoplasty

- Definition
- Common indications
- Public health education regarding keratoplasty & corneal donations

d. Vitamin A deficiency

e. Exposure keratopathy

f. Keratoconus

5. Diseases of the sclera

a. Scleritis

- Definition
- Clinical features

b. Episcleritis

- Definition
- Clinical features

6. Diseases of the lens

a. Cataract

- Epidemiology of Cataract
- Causes and classification of cataract
- Clinical presentation and complications associated with cataract
- Cataract surgery and its complications.
- Health promotion and education strategies for the community regarding prevention of cataract-blindness.

b. Other diseases of the lens

- Subluxation
- Dislocation
- congenital abnormalities

7. Diseases of the uvea

a. Uveitis

- Definition and classification of uveitis

- Causes of Uveitis; infective and non-infective
- Iridocyclitis, clinical presentation and complications
- Choroiditis: definition & clinical presentation
- Intermediate Uveitis; definition & clinical features
- Management of Uveitis; detection & referral guidelines

b. Congenital abnormalities of uvea

- Coloboma
- Aniridia

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Reference Books:

- Stephen J. Miller: Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
- Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007
- A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international (p) Ltd. Publishers, New Delhi, 2007

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Title: Ophthalmic & Optical Instrumentation OD-OAOI 404

Credit hours: 03 (3+0)

Placement: Semester IV, Year II.

Course Description: This course is designed for bachelor's students having their first exposure to ophthalmic & optical instrumentation and contains a comprehensive series of lectures on ophthalmic & optical instrumentation. This course provides a strong foundation so that it will be helpful in future clinic courses.

Learning Objectives:

1. To know about the basic knowledge of direct/indirect ophthalmoscopes, optical principles, clinical uses, and maintenance advantages and disadvantages of each.
2. To know about the basic knowledge of the retinoscope, optical principles, and its clinical uses.
3. To know about the basic knowledge of cross-cylinder, Optical principles and its Clinical uses
4. To know about the basic knowledge of Optical principal and Clinical uses, Maddox rod & Maddox wing
5. To know about the basic knowledge of Tonometer, Optical principles & its Clinical uses
6. To know about the basic knowledge of Optical principles and Clinical uses of Focimeter, Keratometer, Autorefractometer, and Phoropter
7. To know about the basic knowledge of Optics of LVA **(**Hand and stand magnifiers & telescopes)
8. To know about the basic knowledge of Trial case lenses and accessories in the trial box
9. To know about the basic knowledge of Slit lamp, Accessories Optical principles, Clinical uses of Accessories lenses, Hruby lens & 90D, Goniolens, and Placido disc

Learning Outcome

At the end of this course, students will be able to understand the optics of any instrument and principles, and the goal of the course is to provide students with knowledge of measurement of vision and clinical reasoning and interpretation of ray's behavior from instrument to eye.

1. To understand the basic optics of instruments and how it work.
2. To understand the behavior of rays.

3. To understand the pathways of rays and emitted rays.
4. To understand the working distance for using instruments.
5. To understand how to handle, use, care for, and maintain various ophthalmic instruments.
6. To understand how concave and convex lenses work
7. To understand the all-basic terms like a focal point, far point, near point, etc.
8. To understand and create a rays diagram of all optical instruments.
9. To dram a refractive error (rays behaviour)
10. To understand and justify the all working behaviour in field
11. To understand the slit lamp and its all techniques and implementation
12. To understand the magnification concept of microscope and stereoscopic view

Contents:

- Ophthalmoscopes (direct/indirect).
- Retinoscope
- Jackson cross-cylinder
- Maddox rod & Maddox wing
- Tonometer
- Focimeter
- Keratometer
- Autorefractometer
- Phoropter
- LVA **(**Hand and stand magnifiers & telescopes)
- Trial case lenses and accessories in the trial box
- Slit lamp, Accessories lenses, Hruby lens & 90D, Goniolens, and Placido disc
- Microscope

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

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Recommended text book:

1. **Clinical Refraction Book (American Academy)**
2. **Clinical optics (Ellington)**

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Title: Dispensing Optics-I OD- DISP 314

Credit Hrs: 03 (3+0)
Placement: Semester IV, Year II.

Course Description: This course is designed for bachelor's students having their first exposure to dispensing optics and contains a comprehensive series of lectures on dispensing optics. This course provides a strong foundation so that it will be helpful in future clinic courses.

Learning Objectives

1. To know about the Role of dispensing in Ophthalmology
2. To know about the Material of frames and lenses
3. To know about the Parts of Frame
4. To know about the Facial measurement
5. To know about the prescription analysis for distance & near prescription, interpretation, and toric transposition.
6. To know about the Vary focal lenses (Progressive Addition Lenses)
7. To know about the Lensometry of Spheres, Cylinders & Prisms
8. To know about the Aberrations
9. To know about the Lens Designs
    - Aphakic lenses,
    - High-plus lens design,
    - Aspheric design
10. To know about the Frame selection based on spectacle prescription, professional requirements, age group, and face shape
11. To know about the Single vision lenses, Bifocals and trifocals
12. To know about the Photochromic lenses, Antireflection coatings, and Additional benefits for spectacles (Hard coating, tints, MAR)
13. To know about the measurement for spectacle fitting.

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Learning outcomes:

- To understand material and frames
- To understand the different parts of frames
- To measure facial symmetry
- To able the prescription and kind of lens or interpret it
- To understand PAL, a special type of lens and suitable frames for it.
- To understand the neutral of different lenses by lensometer.
- To be able to understand the basic concept of aberrations and lenses, what causes them and how to deal.
- To enable the prescription of special types of frames and their uses.
- To be able to find out different lenses according to transposition
- To understand different types of coatings and tints

Contents:

- Introduction about Ophthalmology, Optometry and Dispenser
- Physical and optical lens material of frames and lenses
- Parts of Frame
- Facial measurement
- Prescription analysis for distance & near prescription
- Interpretation
- Transposition (simple and toric transposition).
- Vary focal lenses (Progressive Addition Lenses)
- Measurement of lens power Focimeter/Lensometry of Spheres, culinder
- Cylinders & Prisms
- Aberrations
- Lens Designs (Aphakic lenses, High-plus lens design, Aspheric design)
- Frame selection
- Spectacle prescription

- Lens type: Single vision lenses, Bifocals and trifocals
- Photochromic lenses, Antireflection coatings
- Quality control

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended Reading:

- **Ophthalmic Lenses and Dispensing—Mohammad Jalie**
- **System for Ophthalmic Dispensing—Clifford W. Brooks, Irvin M. Borish**

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DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: Physiological optics **CODE OD-PHYO 304**

Credit hours: 03 (3+0)

Placement: Semester: IV, YEAR II.

Course Description: The study of eye as it propagates in a variety of media and length. To give a solid theoretical understanding of geometrical and physiological optics. In terms of physiological optics, the course spans the full range of module of eye and its axis and angles.

Learning Objectives

1. To knowledge about the Schematic eye having
   - Anterior focal point
   - Posterior focal point
   - Principle plane I
   - Principle II
   - Nodal point I
   - Nodal point II

2. To knowledge about the Reduce eye having
   - Anterior focal point
   - Posterior focal point
   - Principle plane
   - Nodal point

2. To knowledge about Anisometropia and magnification and minification
   - Picushion distortion
   - Barrel distortion
   - Relative size magnification
   - Relative distance magnification

3. To knowledge about angles of eye.
   - Angle alpha
   - Angle lamda
   - Angle kappa

4. To knowledge about the Axis of eye.
   - Puppilary axis
   - Visual axis
   - Principle plane

5. To knowledge about the Isokonia.
6. To knowledge about the Isometropia

7. To knowledge about the Image formation from spherical surfaces with high prescription.
8. To knowledge about the eye growth with age
9. To knowledge about the eye power over come all the parallel rays on retina.
10. To knowledge about the Anisokonia
11. Knowledge about the lens and cornea power.

Learning outcomes:

At the end of this course, students will be able to have:

- Student able to understand basic knowledge about how eye developed hypermetropia to emmetropia..
- Student able to understand how parallel rays focused on retina without accommodation..
- Student able to identify lens distortion, draw their image.
- Students are able to understand and identify axis.
- Student able to understand angles and also identify these angles helps in squint assessment.
- Student able to understand retinal image concept.
- Student able to understand the difference between schematic and reduce eye modules.
- Student able to understand development of refractive error.
- Student able to understand both magnification and its type
- Student able to understand and draw eye ray diagram with axis and angles.

Contents:

- Parameters of eye
- Geometrical eye
- Schemetical eye
- Reduced eye
- Retinal image size
- Emmetropiazation
- How to develop refractive error
- Angles and axis of eye
- Magnification
- Distortion
- Anisometropia
- Anisokonia
- Isokonia

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Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended books:

- **Clinical Optics – American Academy of Ophthalmology**
- **Optics, Refraction & Contact Lenses – AK Khurrana**
- **Clinical Optics – Andrew Elkington**
- **Clinical Visual Optics – Benetts & Reddets**
- **Clinical Optics & Refraction – Andrew William Kerl**

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SEMESTER V, YEAR III

SYLLABUS

Title: Advance Clinical Refraction OD-ACREF 405

Credit Hrs: 03 (2+1)
Placement: Semester V, Year III.

Course Description: This course is designed for bachelor's students having their first exposure to clinical refraction I and contains a comprehensive series of lectures on clinical refraction I. This course provides a strong foundation so that it will be helpful in future clinic courses.

Learning Objectives

1. To Know about the Importance of history in refraction
2. To Know about the Basic terminologies used in refraction
3. To Know about theVisual acuity measurement in adults and children
4. To Know about the Objective refraction
    - Auto refraction
    - Retinoscopy techniques
    - Retinoscopy movement finding and neutralization
    - Retinoscopy results drawing and calculation of refractive status
5. To Know about the Subjective refraction
    - Subjective refraction without objective refraction
    - Best vision sphere
    - Duochrome test
    - Cross-cylinder technique
6. To Know about the Introduction to cycloplegic refraction
    - Indication of cycloplegic refraction
    - Medications used in cycloplegic refraction
    - Post-mydriatic test
7. To Know about the intrapupilary distance, Importance and its Measurement techniques
8. To Know about the Back vertex distance, Importance and Measurement techniques
9. To Know about the Refractive correction protocol/rules in strabismic patient
10. To Know about the Refractive correction amblyopic patient, anisometropia
11. To Know about the details of myopia, Hyperopia and Astigmatism
12. To know about the details of the accommodation and its types.
13. To know about the details of the Presbyopia and its types.

14. To know about the Management plane
15. To know about the details of the aphakia and its management.
16. To Know about the details of the pseudophakia and its treatment

Learning Outcomes:

1. To know about the Visual Assessment
    - History taken
    - Visual acuity (children and adults)
    - Visual fiels
2. To understand the different methods of binocular balancing
3. To understand the final prescription of glasses and Phoropter and calibration
4. To know about the Amblyopia
5. To understand the cycloplegic refraction and anisometropia.
6. To understand the difference between ocular health and ocular mortilities.
7. To understand the difference between myopia, Hyperopia and Astigmatism
8. To understand the difference between accommodation and presbyopia.
9. To understand the difference between cover test and puppilary test
10. To understand the different Management plane.

Contents:

- Patient profile and History taken
- Ocular health examination
- Refraction (clinically concept)
- Visual acuity (children)
- Visual acuity (adults)
- Visual field
- Ocular motilities
- Basic ocular inspection and associated procedures
- Objective Refraction (Auto refraction, Retinoscopy techniques)
- Subjective refraction: (Best vision sphere, Duochrome test and Cross-cylinder technique)
- Cycloplegic refraction (Indication, Medications, and Post-mydriatic test)
- Phoropter and calibration
- Intrapupilary distance

- Back vertex distance
- Amblyopic patient
- Anisometropia
- Refractive error (Myopia, Hyperopia and Astigmatism) (advanced)
- Accommodation (related to refractive error)
- Presbyopia (it is physiological condition)
- Cover test
- Pupillary light reflex test
- Management plane

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended Reading:

- **American academy optics**
- **Primary care of Optometry**
- **Clinical optics, Elkington**
- **Clinical refraction book by Irvin borish**
- **Clinical visual optics book by Arthur george bennett and ronald b. Rabbetts**

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Title: **OCULAR PHARMACOLOGY** **(OD-OPHAR 405)**

Credit Hrs: **03 (3+0)**

Placement: **SEMESTER V, YEAR III.**

Course Description: Ocular Pharmacology explores the principles of pharmacology as they apply to the eye, focusing on the mechanisms, clinical applications, and side effects of drugs used in diagnosing and treating ocular diseases. The course covers ocular drug delivery methods, autonomic drug actions, anti-infective agents, anti-inflammatory drugs, and treatments for glaucoma, dry eye, and retinal disorders. Emphasis is placed on understanding drug interactions, systemic effects of ocular medications, and the ethical considerations of prescribing.

Course Objectives

By the end of this course, the student will be able to:

1. Understand the basic principles of pharmacology relevant to optometry practice.
2. Explain the mechanism of action of drugs used in common systemic and ocular diseases.
3. Apply ophthalmic and optometric drugs in the diagnosis and management of eye conditions.
4. Interpret prescriptions safely and correctly using pharmacological principles.
5. Identify the indications, contraindications, and side effects of commonly used ophthalmic medications.

Course Outcomes

By the end of this course, the student will be able to:

1. Demonstrate knowledge of **basic pharmacological principles** relevant to systemic and ocular health.
2. Describe the **mechanisms of action and clinical use** of drugs for common systemic and ocular conditions.
3. Apply **ophthalmic drugs safely** in patient care and therapeutic management.
4. Interpret and analyze **prescriptions** accurately for safe optometric practice.
5. Identify **indications, contraindications, precautions, and adverse effects** of ophthalmic medications.

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Course outline:

Introduction to Ocular Pharmacology

Basic pharmacokinetics and pharmacodynamics of ocular drugs

Routes of ocular drug administration (topical, systemic, periocular, intravitreal)

Blood-ocular barriers and drug penetration

Autonomic Drugs and Their Ocular Effects

Cholinergic and anticholinergic agents (e.g., pilocarpine, atropine)

Adrenergic agonists and antagonists (e.g., phenylephrine, timolol)

Mydriatics, cycloplegics, and miotics

Anti-Inflammatory and Immunosuppressive Agents

Corticosteroids: indications, side effects, and complications

Non-steroidal anti-inflammatory drugs (NSAIDs) in ocular therapy

Immunosuppressive agents for uveitis and autoimmune conditions

Anti-Infective Agents in Ocular Disease

Antibiotics for bacterial infections (fluoroquinolones, aminoglycosides)

Antiviral agents for herpes simplex and cytomegalovirus infections

Antifungal and antiparasitic drugs

Glaucoma Pharmacotherapy

Prostaglandin analogs, beta-blockers, carbonic anhydrase inhibitors

Alpha agonists and combination therapies

Drug interactions and systemic side effects

Emergency Ocular Pharmacology

Management of chemical burns and toxic exposures

Anaphylaxis and allergic reactions in eye care

Systemic drugs with ocular side effects

Anesthetic Drugs used for Ocular Surgeries

Classify anesthetic drugs used in ocular surgeries

Understand indications and mechanisms of commonly used agents

Select appropriate anesthetic techniques for different eye surgeries

Recognize drugs affecting intraocular pressure (IOP)

Identify complications and safety precautions in ocular anesthesia

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended books:

"Clinical Ocular Pharmacology" – *Jimmy D. Bartlett & Siret D. Jaanus*

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Title: OCULAR DISEASE-II (OD-ODS 425)

Credit Hrs: 03 (3+0)

Placement: YEAR- 3: SEMESTER V

Evaluation Criteria:

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Course Description:

This course is designed for bachelor's students having their first exposure to systemic diseases cause pathology in the eye; contain a comprehensive series of lectures on Eye diseases. It introduces the students to Eye diseases related to systemic conditions, their pathology, characteristics and treatment. This course provides a strong foundation of eye disease & its basic treatment so that it is helpful in future clinics courses**.**

Learning objectives

- Recognize common signs of orbital diseases: pain, swelling, proptosis, and visual disturbances.
- Differentiate and manage orbital infections, including orbital and preseptal cellulitis, and identify cavernous sinus thrombosis.
- Understand inflammatory orbital diseases, such as orbital pseudotumor, and their management.
- Define proptosis, with focus on Graves' disease: clinical features, diagnosis, and treatment.
- Recognize traumatic orbital lesions, including blow-out fractures, and their clinical management.
- Differentiate enophthalmos from exophthalmos and learn management strategies.
- Identify orbital tumors, understand their presentation, diagnosis, and treatment options.
- Integrate clinical signs, imaging, and investigations to guide diagnosis and management of orbital disorders.

Learning Outcomes

1. Understanding the Pathophysiology
2. Identifying Ocular Manifestations of Systemic Disease
3. Diagnostic Approaches and Techniques
4. Clinical Management and Treatment

5. Case Management and Critical Thinking
6. Understanding Systemic-Disease-Related Complications
7. Research and Emerging Trends

Course Outline:

I Diseases of eye: Diseases of the Orbit:

- Common Sign And Symptoms Associated With The Orbital Diseases Infections (Orbital Cellulites),
- Pre Septal Cellulitis ,
- Cavernous Sinus Thrombosis,
- Inflammatory Orbital Disease,
- Proptosis, Graves Disease**,**
- Traumatic Lesions (Blow Out Fracture),
- Enophthalmos, Exophthalmos,
- Tumors Of The Orbit.
- Clinical Presentation, Prevalence , Diagnosis& Management.
-

ii. Tumors of the eye (Intraocular Tumors):

- Eye Lid Tumors Bening , Malignant
- Tumors Of The Conjunctiva Names And Clinical Presentation,
- Choroid Melanoma, Choroid Hemangioma,
- Metastatic Tumors, Melanocytoma
- Retinal & Optic Nerve Head Tumors (Retinoblastoma).
- Clinical Presentation, Prevalence , Diagnosis& Management.

iii. Diseases of the retina and vitreous:

- Optic Neuritis,
- Optic Atrophy,
- Papilitis,
- Papilloedema
- Hypertensice Retinopathy and stages
- Central Retinal Artery Occlusion
- Branch Retinal Artery Occlusion
- Central Retinal Vein Occlusion
- Branch Retinal Vein Occlusion
- Cmv Retinitis(Cyto Meglo Virus)

- ARMD (Dry & Wet)
- Diabetic Retinopathy
- Retinal Detachment, Types
- Retinitis Pigmentosa
- Clinical Presentation, Prevalence , Diagnosis& Management.

iv. Ocular and orbital trauma:

- Introduction Of Ocular Trauma
- Classification Of Ocular Trauma
- Complication Of Ocular Trauma
- Assessment , Management Types, InvestIgation &Management
- Laceration, Types, InvestIgation &Management
- Investigation & Management

v. Glaucoma

- Pathogenesis
- Causes And Classification
- Clinical Presentation And Outcome, Prevalence , Visual Field Defects , Diagnosis, Management .

Vi SYSTEMIC DISEASES AFFECTING THE EYE

- Retinal Hemorrhages
- Acute Ocular Ischemia
- Optic Disc Infarction
- Retinal Infarction
- Transient Retinal Ischemia (Amaurosis Fugax)
- Carotid Occlusive Disease
- Carotid Cavernous Fistula
- Benign Intracranial Hypertension (Pseudotumor Cerebri)
- Subacute Infective Endocarditis
- Hematologic And Lymphatic Disorders
- Metabolic Disorder, Diabetic Mellitus , Diabetic Retinopathy,
- Graves Disease
- Vitamins And Eye Disease
- Granulomatous Disease
- Tuberculosis
- Sarcoidosis
- Eales' Disease
- Toxoplasmosis
- AIDS (HIV Retinopathy)

vii. Ocular emergencies and the management of "red eye":

- Pattern Of Ocular Emergencies Based On The Degree Of Urgency Regarding Management
- Those Demanding Management Within Minutes (Immediate)
- Within Hours (Early And Within Days (Late),
- Patient Assessment And Management
- Clinical Presentation, Prevalence , Diagnosis& Management.

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Reference Books:

Ocular Disease: Mechanisms and Management by Joel S. Schuman, et al.
Clinical Ocular Pharmacology by Alfred E. M. Leahy
Kanski's Clinical Ophthalmology: A Systematic Approach by Brad Bowling

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: DESPENSING OPTICS-II OD-DISP 425

Credit hour: 03 (3+0)
Placement: Semester V, Year III.

Course Description: This course is designed for bachelor's students having their second exposure to dispensing optics II. It contains a comprehensive series of lectures on dispensing optics. It introduces the students to different lenses & their dispensing. This course provides a strong foundation of lenses, glasses, & it's dispensing so that it's helpful in future clinic courses.

Learning objectives:

1. To understand the Polarizing lenses
2. To enhance vision by advancement lenses
3. To know about clear concept about Tints & Fitters
4. To know about fitting and assessment of glass material into frame
5. To know about fitting and assessment of plastic material into frame
6. To know about Special types of spectacle frames
    - Monocles
    - Ptosis crutches
    - Industrial safety glasses, Welding glasses
7. To know about Toric transposition (simple and toric)
8. To know about final checking & dispensing of spectacles to customers, counseling on wearing & maintaining spectacles, accessories—bands, chains, boxes, slevets, cleaners, screwdriver kits.
9. To know about Faults in spectacles (lens fitting, frame fitting, patients' complaints, description, detection and correction)
10. To perform many times and get expertise in practical assessment of IPD
11. To perform many times and get expertise in practical assessment of BVD
12. To learn manual prescription analysis

Learning Outcomes.

- Student able to differentiate between polarized and non-polarized lenses
- Student knows about advancement in refraction about vision.

- Student able to differentiate between tints and filters
- Student able to differentiate material of frames
- To able to transposition.
- To understand different types of frames and face symmetry.
- To learn how to satisfy post-refraction error by counseling.
- Student able to perform practically and find out the result of IPD and BVD
- The student was able to find out the final prescription after analyzing it.

Contents:

- IPD and BVD
- Lens type: multifocal lens
- Polarizing lenses
- Progressive lens : History and development
- Progressive lens : Design and concept
- Progressive lens : Customised
- Tints & Fitters
- Glass material into frame
- Plastic material into frame
- Special types of spectacle frames (Monocles, Ptosis crutche, Industrial safety glasses, Welding glasses)
- Lens power and thick lens
- Ophthalmic prisms
- Effectively and high power lenses
- Toric transposition (simple and toric) in practices
- Aberration and lens design
- Counseling about all things
- Faults in spectacles
- Lens thickness
- Lens notation
- Prescription analysis

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DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended Reading:

- **System for Ophthalmic Dispensing, 3rd Edition**
- **Clifford W. Brooks**
- **Ophthalmic Lenses and Dispensing—Mohammad Jalie**
- **System for Ophthalmic Dispensing—Clifford W. Brooks, Irvin M. Borish**

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **Paediatric Optometry (**OD-PEAD 405**)**

Credit Hrs: **03(3+0)**

Placement: **YEAR- 3: SEMESTER V**

Course Description:

This course provides comprehensive knowledge and clinical understanding of visual development and paediatric eye care from infancy through childhood. It focuses on the assessment of visual function, refraction, accommodation, binocular vision, and ocular health in children. Emphasis is placed on normal and abnormal visual development, evidence‑based prescribing, paediatric ocular pathologies, and clinical decision‑making through case studies. The course equips students with the theoretical foundation and practical skills required to evaluate, diagnose, and manage visual conditions in the paediatric population.

Learning Objectives:

By the end of this course, students will be able to:

- Understand the principles of **visual development** in infants and children.
- Perform age‑appropriate **paediatric visual assessments** including visual acuity, refraction, and binocular vision testing.
- Explain the role of **accommodation and stereopsis** in normal and abnormal vision development.
- Identify and interpret the effects of **abnormal visual experiences** on visual maturation.
- Apply **evidence‑based approaches** to refractive development and prescribing in children.
- Recognize common **paediatric ocular pathologies** and their impact on vision.
- Analyze clinical scenarios using **case‑based learning** to enhance diagnostic and management skills.

Learning Outcomes:

Upon successful completion of the course, students will be able to:

1. Conduct paediatric visual function testing, including assessment of visual acuity, accommodation, and stereopsis.
2. Accurately perform paediatric refraction and evaluate accommodative function using age‑appropriate techniques.
3. Describe normal refractive and visual development from infancy to adolescence.

4. Assess the impact of abnormal visual experience (e.g., amblyopia, strabismus) on visual development.
5. Evaluate colour vision and binocular vision in the paediatric population.
6. Apply evidence-based prescribing principles for refractive errors in children.
7. Identify common paediatric ocular pathologies and determine appropriate referral or management.
8. Integrate theoretical knowledge with clinical practice through case study analysis and presentations.

Course Content:

1. Paediatric testing: visual function

2. Paediatric testing: refraction and accommodation

3. Visual Acuity

4. Effect of abnormal visual experience on visual development

5. Stereopsis

6. Accommodation

7. Colour Vision

8. Normal refractive development

9. Refractive development and evidence based prescribing

10. Paediatric ocular pathology

11. Case studies

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended Books

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

1. Pediatric Optometry – Jerome Rosner
2. Clinical Pediatric Optometry – David A. Press
3. Binocular Vision and Ocular Motility – Gunter K. von Noorden & Emilio C. Campos
4. Pediatric Ophthalmology and Strabismus – Kenneth W. Wright & Peter H. Spiegel
5. Optometry: Science, Techniques and Clinical Management – Mark Rosenfield & Nicola Logan

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **BASIC OCULAR INVESTIGATION (OD-BOIN 405)**

Credit Hrs: **03(3+0)**

Placement: **YEAR- 3: SEMESTER V**

Course Description:

The Basic Ocular Investigation course is designed to introduce students to the foundational techniques and diagnostic tools used in clinical optometry and ophthalmology to assess the health and function of the eye. The course will provide students with essential skills in performing basic ocular examinations and understanding the diagnostic processes that are used to evaluate various ocular conditions. Emphasis will be placed on developing proficiency in common clinical investigations, including visual acuity tests, refraction, tonometry, fundoscopy, and slit-lamp biomicroscopy. This course is intended to equip students with the practical knowledge required to conduct accurate eye exams and interpret the results to inform diagnosis and treatment.

Course Objectives

By the end of this course, the student will be able to:

- Understand the **principles and purpose** of common ocular diagnostic tests.
- Perform **basic ocular examinations and investigations** safely and accurately.
- Interpret **clinical findings** from standard ocular tests.
- Apply ocular investigation results in **diagnosis and patient management**.
- Practice **professionalism, infection control, and patient-centered care** during investigations.

Learning Outcomes: Upon completion of the Basic Ocular Investigation course, students will be able to:

1. Perform a comprehensive ocular examination using standard diagnostic equipment and techniques.
2. Accurately assess and interpret visual acuity and refractive errors.
3. Measure intraocular pressure using tonometry.
4. Effectively use a slit-lamp biomicroscope to examine the anterior segment and identify common pathologies.

5. Conduct a detailed fundus examination to evaluate retinal health and identify signs of systemic and ocular diseases.
6. Understand the indications and applications of various diagnostic tests in clinical optometry and ophthalmology.
7. Communicate effectively with patients regarding examination procedures and results.
8. Document clinical findings in a systematic and professional manner to aid in diagnosis and treatment planning.

Course Content:

Throughout this course, students will learn to:

- **Perform Visual Acuity Testing**: Understand the different methods for testing both distance and near vision using Snellen charts and other specialized acuity charts.
- **Conduct Refraction and Assess Refractive Errors**: Learn the process of subjective and objective refraction to determine refractive errors such as myopia, hyperopia, astigmatism, and presbyopia.
- **Intraocular Pressure (IOP) Measurement**: Gain proficiency in using tonometry to assess intraocular pressure as a screening tool for glaucoma.
- **Examine the Anterior Segment**: Learn to use a slit-lamp biomicroscope to evaluate the eye's anterior structures, including the cornea, lens, and iris, to detect common disorders like cataracts or corneal abrasions.
- **Fundus Examination**: Develop the skills needed for performing indirect ophthalmoscopy and fundoscopy to examine the retina, optic nerve, and macula for conditions such as diabetic retinopathy, macular degeneration, and glaucoma.
- **Pupil Reactions**: Understand and assess the pupillary light reflex and the near reaction to screen for neurological and ocular disorders.
- **Confrontation Visual Field Testing**: Learn to perform basic visual field testing to detect any peripheral vision loss associated with glaucoma or neurological disorders.

Assessment & Evaluation

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Recommended Reference

1. "Clinical Optometry: A Guide to Clinical Procedures" by R. M. I. Mather
2. Ocular Examination and Diagnosis" by Myron Yanoff and Jay S. Duker

3. "Basic and Clinical Science Course: Section 9 – Eyelid, Conjunctiva, and Tear Film" by American Academy of Ophthalmology
4. Clinical Procedures in Primary Eye Care" by David B. Elliott

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **BASIC CONTACT LENS (OD- BCLEN 406)**

Credit Hrs: **03 (3+0)**

Placement: **YEAR- 3: SEMESTER VI**

Evaluation Criteria:

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Course Description:

This course provides Doctor of Optometry students with a foundational understanding of contact lens theory and clinical application. Emphasis is placed on the principles of contact lens optics, lens materials, design, and fitting philosophies for soft and rigid gas permeable lenses. Students will learn patient selection, initial fitting procedures, evaluation of lens performance, and basic troubleshooting of common contact lens–related complications. The course also introduces care systems, patient education, and safety considerations necessary for successful contact lens wear. By the end of the course, students will be prepared to apply basic contact lens knowledge in clinical settings and build a framework for advanced contact lens practice.

Learning Objectives

Upon completion of the Basic Contact Lens course, students will be able to:

A. Basics of Contact Lenses

- Describe anterior segment anatomy and physiology relevant to lens wear.
- Summarize the history and evolution of contact lenses.
- Apply optics principles to understand lens power and performance.
- Differentiate contact lens designs and their clinical indications.
- Explain lens fabrication and its effect on comfort and vision.
- Assess corneal oxygen needs and lens impact on corneal physiology.

B. Contact Lens Fitting

- Conduct comprehensive patient examinations for lens suitability.
- Select lens type, modality, and replacement schedule based on patient needs.
- Fit and evaluate rigid gas permeable (RGP) and soft lenses.
- Correct astigmatism and presbyopia with appropriate lens options.
- Dispense lenses, provide after-care, and manage complications.
- Recommend lenses for sports and other lifestyle needs.

Learning Outcomes
Students will be able to:

- Demonstrate proper contact lens fitting and evaluation skills.
- Select lenses tailored to ocular health, vision needs, and lifestyle.
- Optimize vision, comfort, and patient satisfaction with lens choices.
- Manage lens care, complications, and patient education effectively.
- Integrate theory of optics, corneal physiology, and lens design into clinical practice.

Course Outline:

A. The Basics of Contact Lenses

A1 Anatomy and Physiology of the Anterior Segment

A2 History of Contact Lenses

A3 The Optics of Contact Lens

A4 Contact Lens Designs

A5 Contact Lens Fabrication

A6 Corneal Oxygenation in Contact Lens Wear

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B. Contact Lens Fitting

B1 Examining the Prospective Contact Lens Patient
B2 Selecting Lens Type, Wear Mode and Replacement Rate
B3 Fitting Spherical GP Contact Lenses
B4 Fitting Spherical Soft Contact Lenses

B5 Correcting Astigmatism with Contact Lenses
B6 Fitting Silicone Hydrogel Contact Lenses
B7-The-Dispensing-and-After-Care-Visit
B8 Contact Lenses for Sports
B9 Presbyopic Contact Lens Options

Recommended Reading:

1. **International Association of Contact Lens Educators. (2026). Title of Module or Module Number. ICLC 2026 Module.**
2. **Clinical Procedures in Primary Eye Care - Dave Elliott's**
3. **The Contact Lens Manual – Andrew Gasson**
4. **Contact Lenses – Ken Deniels**
5. **Contact Lens Practice - Robert B Mandell**
6. **Contact lens manual**

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

TITLE: **LOW VISION-I** **(**OD-LOW 416)
CREDIT HRS: **03**
PLACEMENT: **SEMESTER VI YEAR III.**

Course description:

This course is intended to provide basic knowledge of epidemiology, causes, its tests and its management by optical and non-optical devices.

COURSE CONTENTS:

The overall prevalence of blindness around the globe demands for well trained Eye Care Professionals like Optometrists. The latest developments in the field of ophthalmology in ratio with the new disease condition are the greatest challenges for the Optometrists. It has been revealed that there is a strong need to provide structured training for the Optometrists.Hence, there needs to be a focus on the basics that includes to rule out the diagnosis & management of low vision. This course will primarily focus on the assessment, diagnosis & management of visual impairment. This course will focus on the management of low vision via optical or non-optical devices and special visual training.

Learning Objectives:
By the end of this course, students will be able to:

- Understand the epidemiology of low vision, including its definition and global prevalence.
- Identify the common causes of low vision and their impact on daily life.
- Conduct comprehensive patient history-taking and interviews to assess visual impairment.
- Perform essential assessment tests and supplementary evaluations for low vision diagnosis.
- Analyze and interpret the results of color vision tests, visual field tests, and visual acuity measurements.
- Demonstrate proficiency in evaluating and prescribing low vision devices such as magnifiers, telescopes, and filters.
- Calculate and apply appropriate magnification for different optical and electronic low vision aids.
- Understand the function and application of high-tech electronic low vision devices.
- Implement environmental modifications to enhance the visual abilities of individuals with low vision.
- Develop strategies for visual training and rehabilitation tailored to individual patient needs.
- Apply knowledge of special considerations in low vision management, including psychological and social aspects.

- Demonstrate competency in prescribing and training patients in the effective use of low vision devices.

Learning Outcomes:

- Upon successful completion of this course, students will be able to:
- Assess and diagnose low vision conditions using standardized clinical methods.
- Select and prescribe appropriate optical, non-optical, and electronic low vision devices based on individual patient needs.
- Educate patients on the proper use of low vision aids to maximize their visual potential.
- Develop and implement personalized low vision rehabilitation programs.
- Recommend suitable environmental modifications to improve the quality of life for individuals with visual impairment.
- Apply evidence-based approaches in the assessment and management of low vision cases.

Course Outline:

1. Epidemiology of Low Vision – Definition, global situation.
2. Causes of low vision
3. Patient history & interview
4. Assessment tests
5. Supplementary Tests (Color Vision, Visual Field, Visual Acuity, Magnification, Low Vision Devices)
6. EVD, EVP. Optical Devices for distance use
7. Telescopes
8. Filters
9. Optical Devices for near
10. Magnifiers and their calculations
11. Electronic and high tech low vision devices
12. Low vision enhancement system
13. Uses of low vision devices

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- **Total: 100%**

Recommended Reading:

1. **Primary care Low Vision – Nowakowski**
2. **Clinical Optics – American Academy of Ophthalmology**

American Academy
BHVI notes

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **BASIC ORTHOPICS (OD-BORTH 406)**
Credit Hrs: **03 (3+0)**
Placement: **Semester VI, Year III.**

Course Description:

This course provides a comprehensive foundation in **ocular motility, binocular single vision (BSV), and strabismus**. It covers the **anatomy and physiology of extraocular muscles**, mechanisms of **ocular movements**, and the principles underlying **binocular single vision and retinal correspondence**. Students are introduced to **pseudo-strabismus, heterophoria, and heterotropia**, with emphasis on **clinical differentiation and diagnosis**. The course emphasizes **clinical assessment of squint**, including subjective and objective methods such as **cover tests, corneal reflex tests, prism cover test, Maddox rod and wing, and diagnostic occlusion**. Measurement and clinical significance of the **AC/A ratio** are discussed in detail. The course also explores **non-surgical management strategies for strabismus**, including optical correction, prisms, occlusion therapy, and orthoptic exercises. The course integrates **theoretical concepts with clinical application**, preparing students to competently assess, diagnose, and manage common binocular vision and strabismus conditions in optometric practice.

Course Learning Objectives

By the end of this course, students will be able to:

1. Understand the **anatomy, actions, and innervation of extraocular muscles**.
2. Explain the **physiology of ocular movements** and related terminologies.
3. Describe the **concept, requirements, and significance of binocular single vision**.
4. Understand **retinal correspondence** and methods used for its assessment.
5. Differentiate between **pseudo-strabismus, heterophoria, and heterotropia**.

6. Develop proficiency in **clinical assessment of squint angle** using standard techniques.
7. Measure and interpret the **AC/A ratio** and understand its clinical indications.
8. Understand the **principles of non-surgical management of strabismus**.
9. Apply theoretical knowledge to **clinical decision-making in binocular vision anomalies**.
10. Build a foundation for advanced learning in **orthoptics, pediatric optometry, and binocular vision therapy**.

Course Learning Outcomes

On completion of this course, students will be able to:

- Explain the **anatomy and function of extraocular muscles** and ocular movements.
- Demonstrate understanding of **binocular single vision and retinal correspondence**.
- Differentiate between **pseudo-strabismus, heterophoria, and heterotropia**.
- Perform and interpret **standard clinical tests for squint assessment**.
- Measure and apply the **AC/A ratio** in clinical decision-making.
- Formulate **non-surgical management plans for strabismus** using optical, prism, occlusion, and orthoptic methods.

Course Outline:

1. **Anatomy of muscles and its functions**
2. **Ocular Movements and its related terminologies**
3. **Introduction of binocular Single Vision and its assessment**
4. **Retinal correspondence and its assessment**

5. Pseudo strabismus

6. Hetrophoria

7. Hetrotropia

8. Clinical assessment of Squint angle

a. Cover test, Uncover test. Alternate cover test

b. Corneal reflection test
c. Prism cover test
d. Diagnostic occlusion
e. Maddox rod
f. Maddox wing

9. AC/A ratio measurement and its indication

10. Non-surgical management of strabismus

a. Optical
b. Prism
c. Patching therapy
d. Orthoptic exercises

1. Criteria for patient selection
2. Dangers of orthoptic exercises
3. Purpose of exercises
4. Exercises to aid control of the deviation
5. Extension of the fusion amplitude
- Positive fusion amplitude (convergence)
- Negative fusion amplitude (divergence)
6. Improvement of relative (fusional) convergence
- Positive relative convergence
- Negative relative convergence
7. Improving the near point of convergence
- Pencil push up exercise
- Dot card exercise

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Evaluation Criteria:

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Recommended Reading:

- American Academy of ophthalmology Section 6(Pediatric and Strabismus)
- Diagnosis and Management of Ocular Motility Disorders (Anson & Devis)
- Clinical Orthoptics (Fiona j rowe)

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Course : Communication Skills & Medical Ethic

Course Code: OD-CSME 406

Credit Hrs: 03 (2+1)

Placement: YEAR- 3: SEMESTER VI

Course Description:

This course develops effective communication skills and ethical competence required for optometry practice. It focuses on patient-centered communication, professional behavior, confidentiality, informed consent, and ethical decision-making in healthcare, aligned with international optometry standards.

Course Objectives:

After completing this course, students will be able to:

1. Communicate effectively with patients, families, and healthcare professionals
2. Demonstrate professional behavior and ethical responsibility in clinical settings
3. Understand ethical principles and legal aspects of medical practice
4. Apply ethical decision-making in optometric care

Learning Outcomes:

On successful completion of this course, students will:

1. Demonstrate effective verbal and non-verbal communication skills
2. Conduct patient interviews and history taking professionally
3. Apply principles of medical ethics in clinical scenarios
4. Respect patient confidentiality and informed consent
5. Exhibit professionalism

Course Content Outline:

1. Patient-Centered Communication in Optometry

2. Clinical Interviewing & Case History Taking

3. Professional Verbal & Non-Verbal Communication

4. Interprofessional & Team-Based Communication
5. Medical Ethics & Ethical Frameworks
6. Informed Consent, Confidentiality & Patient Rights
7. Legal & Regulatory Aspects of Optometry Practice
8. Ethical Issues in Clinical & Commercial Optometry
9. Digital Health, Tele-Optometry & Professionalism

Assessment Methods:

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended Textbooks & References:

1. Silverman J, Kurtz S, Draper J. *Skills for Communicating with Patients*. Radcliffe Publishing.
2. Beauchamp TL, Childress JF. *Principles of Biomedical Ethics*. Oxford University Press.
3. General Optical Council (UK). *Standards of Practice for Optometrists*.
4. World Council of Optometry (WCO) – Ethical Guidelines.

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: CLINICAL OPTOMETRY PROCEDURE-I OD-CLIN 416
Credit Hrs: **03**
Placement: **Semester VI, Year III.**

Course Description:

This course provides in-depth theoretical and clinical training in objective and subjective refraction techniques, assessment of accommodation and presbyopia, and comprehensive ocular health examination. Emphasis is placed on the correct use of diagnostic instruments, including the slit lamp biomicroscope, to evaluate the anterior segment of the eye. The course prepares students to accurately assess refractive status, manage accommodative disorders, identify presbyopia, and detect common ocular abnormalities through systematic clinical examination.

Learning Objectives:

By the end of this course, students will be able to:

Understand the principles of objective and subjective refraction.
Develop proficiency in retinoscopy and subjective refinement techniques.
Explain the mechanism of accommodation and presbyopia.
Perform comprehensive ocular health examinations.
Use the slit lamp biomicroscope effectively for anterior segment evaluation.

Learning outcomes:

Upon successful completion of the course, students will be able to:

Perform accurate objective and subjective refraction in clinical settings.
Assess accommodative function and manage presbyopic patients.
Identify normal and abnormal findings during ocular health examinations.
Competently use slit lamp biomicroscopy to examine anterior ocular structures.
Record and interpret clinical findings for appropriate patient management and referral.

Course outline:

1. Objective Refraction

- **Retinoscopy:**
  - **Static and dynamic retinoscopy**
  - **Working distance and neutralization**
  - **With-motion and against-motion reflexes**
  - **Scissor reflex and its clinical significance**
- **Autorefraction:**
  - **Comparison with retinoscopy**
- **Advantages and limitations of objective methods**

- **Clinical interpretation and recording of findings**

2. Subjective Refraction

- **Principles of subjective refraction**
- **Refinement of sphere, cylinder, and axis**
- **Duochrome (red-green) test**
- **Jackson Cross Cylinder (JCC) technique**
- **Binocular balancing:**
  - **Purpose and methods**
- **End-point determination**
- **Prescribing considerations based on subjective findings**

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3. Accommodation and Presbyopia

- **Physiology of accommodation**
- **Amplitude of accommodation:**
  - **Measurement techniques**
- **Accommodative anomalies:**
  - **Accommodative insufficiency**
  - **Accommodative excess**
  - **Accommodative infacility**
- **Presbyopia:**
  - **Etiology and progression**
  - **Clinical signs and symptoms**
- **Presbyopic correction:**
  - **Near addition determination**
  - **Single vision, bifocal, and progressive lenses**

4. Ocular Health Examination

- **Importance of ocular health assessment in optometric practice**
- **Patient history and symptom analysis**
- **External ocular examination:**
  - **Eyelids, lashes, conjunctiva, sclera**
- **Pupillary assessment and basic neurological screening**
- **Identification of common anterior segment disorders**

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5. Slit Lamp Biomicroscopy

- Principles and components of the slit lamp
- Illumination techniques:
    - Diffuse illumination
    - Direct focal illumination
    - Retro-illumination
    - Sclerotic scatter
- Examination of:
    - Eyelids and lashes
    - Conjunctiva and sclera
    - Cornea
    - Anterior chamber
    - Iris and crystalline lens
- Clinical documentation and grading of findings

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended book:

- **Kanski 8th edition**
- **Ocular Investigation (American academy)**
- **Fiona clinical Orthoptics**

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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SYLLABUS

TITLE: **LOW VISION-II (**OD-LOW 427)

CREDIT HRS: **03**

PLACEMENT: **YEAR- 4 SEMESTER VII**

SYLLABUS

Course description:

This course is intended to provide basic knowledge of epidemiology, causes its tests and its management by optical and non-optical devices.

Course Objectives

By the end of this course, the student will be able to:

1. Understand advanced low vision assessment techniques for diverse patient populations.
2. Perform comprehensive functional vision evaluations and visual performance testing.
3. Prescribe and demonstrate advanced low vision aids and assistive technologies.
4. Integrate rehabilitation strategies into patient-centered care plans.
5. Collaborate with interdisciplinary teams to optimize quality of life for low vision patients.

Course Learning Outcomes

On successful completion, students will be able to:

- Conduct advanced low vision assessments, including visual acuity, contrast sensitivity, visual fields, and reading performance.
- Evaluate complex ocular and systemic conditions affecting vision and functional ability.
- Recommend, fit, and train patients on high-magnification devices, electronic aids, telescopes, and orientation & mobility tools.
- Develop personalized rehabilitation plans, including environmental modifications and adaptive strategies.

- Communicate effectively with patients, families, and healthcare teams to support independence and quality of life**.**

COURSE CONTENTS:

1. **Introduction**
    a. Definitions
    b. Multidisciplinary approach to low vision care
    c. LV services at Primary, Secondary and Tertiary levels
    d. The role of optometrist/patient/family and the community
    e. Psychological implications of low vision
2. **Epidemiology of Low Vision; definition and Global Situation**
3. **Causes of Low Vision**
4. **History taking**
5. **Clinical assessment of low vision patients in children and adults: visual acuity assessment and charts**
6. **Magnification**
    a. Definition
    b. Types of Magnification (RSM, RDM, Angular, and Projection) its application in Optical devices
    c. EVD, EVP
7. **Low vision devices**
    a. Non-optical aids
    b. Optical devices
    c. Electronic devices
8. **Low Vision Devices (Non-Optical)**
    a. What are low vision devices?
    b. What are the types of low vision devices?
    c. What are non-optical low vision devices?
    d. How non-optical devices help a low vision person?
9. **Low Vision Devices (Optical)**
    a. What are optical low vision devices?
    b. What are the different types of optical devices?
    c. How these optical systems work?
    d. What the advantages and disadvantages of these devices
    e. What are low vision optical devices for near?
    f. How to measure EVD and EVP for these devices**?**
10. **Aids for Peripheral Field Loss**
    a. What is peripheral field loss
    b. How does it affect vision?
    c. Devices used for enhancing peripheral vision. How do these devices work?
11. **Optical Devices for distance use – Telescopes & Filters**

12. **Optical Devices for near use – Magnifiers and their calculation**
13. **Special techniques and orientation and mobility guidelines**
14. **Counseling and rehabilitation, environmental modifications, building designs and adaptive daily skills**
    a. What is functional vision?
    b. What is residual vision?
    c. How to effectively use residual vision?
    d. What is orientation & mobility?
    e. Classification of everyday activities
    f. Special tips & techniques for independent living
    g. What are environmental modifications?
    h. What are adaptive daily skills?
    i. How can special alterations/incorporations in building design be of assistance?

Assessment & Evaluation

Internal Evaluation: 15%

Mid-term Examination: 15%

Terminal Examination: 70%

Total: 100%

RECOMMENDED BOOKS

14. Primary Care of Low Vision
15. Understanding Low Vision
16. American Academy
17. BHVI notes

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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Title: **ADVANCED ORTHOPTICS (OD-AORT 407)**
Credit Hrs: **03 (2+1)**

Placement: **SEMESTER VII, YEAR IV.**

Course Description:

This course provides advanced knowledge and clinical skills in the evaluation, diagnosis, and surgical management of complex ocular motility and binocular vision disorders. Emphasis is placed on alphabet pattern strabismus, abnormal head posture, congenital and acquired muscle anomalies, and neuro-ophthalmic conditions affecting eye movements.

Students are trained in advanced clinical assessment techniques, including the three-step test, Hess charting, and detailed motility evaluation, to differentiate neurogenic, myogenic, and mechanical causes of strabismus. The course covers important conditions such as infantile strabismus, Duane's retraction syndrome, Brown's syndrome, cranial nerve III, IV, and VI palsies, internuclear ophthalmoplegia, myasthenia gravis, and orbital injuries.

The course prepares optometry students for effective practice in tertiary care hospitals and CPSP-linked training centers, with a strong focus on clinical reasoning, prognosis, non-surgical management, and appropriate referral and co-management within the professional scope of optometry.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand the **classification, etiology, and clinical features of alphabet pattern strabismus**.
2. Develop competence in the **clinical evaluation of complex ocular motility disorders**.
3. Analyze **neurogenic, myogenic, and mechanical causes of strabismus**.
4. Apply advanced diagnostic tests such as the **3-step test and Hess chart**.

5. Understand the **pathophysiology and presentation of cranial nerve palsies and neurological disorders** affecting eye movements.

6. Plan appropriate **surgical management and referral strategies** for complex strabismus cases.

Learning Outcomes:

On completion of this course, students will be able to:

1. **Identify and classify** A- and V-pattern strabismus and related muscle anomalies.

2. **Investigate and differentiate** congenital and acquired ocular motility disorders.

3. **Evaluate abnormal head posture** and relate it to underlying strabismus patterns.

4. **Perform and interpret** advanced diagnostic tests including the **3-step test and Hess chart**.

5. **Diagnose and differentiate** neurogenic, myogenic, and mechanical strabismus conditions.

6. **Recognize, assess, and manage** cranial nerve III, IV, and VI palsies and INO within optometric scope.

7. **Formulate management plans** and identify cases requiring timely referral or co-management.

Course outline:

- **Alphabet Patterns,**
  - **Classification**
  - **Criteria for diagnosis**
  - **Incidence**
  - **Aetiology**
  - **Anomalies of vertical muscle action**
  - **Anomalies of horizontal muscle action**
  - **Disorders commonly associated with alphabet**
    - **Infantile strabismus**
    - **Duane's retraction syndrome**

- **Brown's syndrome**
- **Acquired bilateral fourth cranial nerve palsy**
- **Dysthyroid eye disease with inferior rectus muscle**
- **contracture**

- **Investigation of V- and A-patterns**
- **Aims**
- **Observation of the patient**
- **Clinical investigation**
- **Significance of V- and A-patterns**
- **Differential diagnosis**
- **Prognosis**
- **Management**
- **Management of alphabet patterns**

➢ **Surgical management of strabismus**
➢ **Abnormal Head Posture**
➢ **Clinical evaluation techniques of strabismus**
- **3 step test**
- **Hess Chart**

➢ **Differential diagnosis of congenital and acquired palsies.**
➢ **Microtropia and allied conditions**
➢ **Neurological disorders and management**
➢ **Neurogenic disorders and management**
➢ **Myogenic disorders and management**
- **Myasthenia gravis**
- **Chronic progressive external ophthalmoplegia (CPEO)**

➢ **Mechanical restriction of muscles and its management**
- **Duane's retraction syndrome**
- **Brown's Syndrome**
- **Orbital Injuries**

➢ **Cranial nerve III, IV, and VI palsies**
➢ **lnternuclear ophthalmoplegia (INO)**
- **Description**
- **Anatomical pathway**
- **Aetiology**
- **Types**
- **Features**
- **Diagnosis**

- **Differential diagnosis**
- **Management**

8.

Evaluation Criteria:

Internal Evaluation: 15%
Mid-term Examination: 15%
Terminal Examination: 70%
Total: 100%

Recommended Reading:

- American Academy of ophthalmology Section 6(Pediatric and Strabismus)
- Diagnosis and Management of Ocular Motility Disorders (Anson & Devis)
- Clinical Orthoptics (Fiona j rowe)

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Title: **OPD AND OT PROCEDURE** **Course Code:** **OD-OATP 407**

Credit Hrs: **03 (0+3)**

Placement: **Semester VII, Year 4th**

Course description:

This course introduces students to the principles, protocols, and practical skills required for effective functioning in outpatient (OPD) and operating theatre (OT) settings, emphasizing patient safety, asepsis, and clinical efficiency.

Learning Objectives:

By the end of this course, the student will be able to:

- Understand the workflow and procedures in OPD and OT settings.
- Learn standard protocols for patient preparation, asepsis, and instrument handling.
- Develop skills in assisting ophthalmic procedures and minor surgeries.
- Gain knowledge of infection control and patient safety measures.

Learning Outcomes:
By the end of the course, students will be able to:

- Demonstrate proper patient handling and preparation in OPD and OT.
- Apply aseptic techniques and maintain sterile environments.
  Assist effectively during ophthalmic procedures and surgeries.
- Identify and follow standard safety and infection control protocols.

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended books:

1. Training manual for the ophthalmic assistant working in a surgical cataract eye camp by Dr. Ayesha S Abdullah
2. Clinical Ophthalmology, Shafi Jatoi.

3. Clinical Ophthalmology, Shafi Jatoi,
4. Ophthalmic O.T practice manual.

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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Title: **NEUROLOGICAL EYE DISEASE-I (OD-NEURO 417)**
Credit Hrs: **03 (3+0)**

Placement: **SEMESTER VII, YEAR IV.**

Course Description:

This course introduces the fundamental neurological disorders affecting the visual system, with emphasis on clinical features, basic pathophysiology, and ocular manifestations. The focus is on recognition, assessment, and referral of common neuro-ophthalmic conditions encountered in optometric practice.

The course builds a foundation for understanding visual pathway involvement in neurological disease and prepares students for advanced clinical courses.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand the basic concepts of neuro-ophthalmology.
2. Recognize common neurological disorders affecting vision.
3. Correlate clinical signs with visual pathway involvement.
   Develop skills in initial assessment and referral.
4. Prepare for advanced neuro-visual learning.

Learning Outcomes:

On completion of this course, students will be able to:

1. Identify common optic nerve and pupillary disorders.
2. Interpret visual field defects of neurological origin.
3. Recognize red-flag signs requiring urgent referral.
4. Perform basic neuro-ophthalmic assessment in the clinic.
5. Communicate findings effectively within a multidisciplinary team.

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Course outline:

1. Neuroanatomy of the Visual Pathway – CNS, cranial nerves, visual cortex
2. Cranial Nerve Function & Ocular Motor Control – III, IV, VI
3. Optic Nerve & Optic Pathway Basics – structure, function, disease patterns
4. Visual Field Testing & Interpretation – confrontation, automated perimetry
5. Basic Neuro-Ophthalmic Assessment – pupillary reactions, ocular motility
6. Common Neuro-Ophthalmic Conditions – optic neuritis, ischemic optic neuropathy, diplopia
7. Pediatric Neuro-Ophthalmology (Introductory)
8. Clinical Documentation & Patient Communication (Basic)
9. Introduction to Neuro-Imaging – MRI, CT basics

Evaluation Criteria:

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended Books:

"Neuro-Ophthalmology Virtual Textbook" (by Dr. Miller, Open Access Online)
Link: https://www.neuro-ophthalmology-online.com

NCBI Bookshelf / PubMed Central
Free full-text books and review articles on strabismus, visual perception, and neuro-ophthalmology.
https://www.ncbi.nlm.nih.gov/books/

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Title: CLINICAL OPTOMETRY PROCEDURE-II OD-CLIN 427

Credit Hrs: 03

Placement: Semester VII, Year IV.

Course Description:

This course will introduce the students to the various investigative procedures used in ophthalmology and optometry and the equipments. This will also teach them the techniques used for these procedures including patient preparation and measures that should be taken in case of complication thus enabling them to conduct various investigations and analyze their results.

Learning outcomes:

- **Objective & Subjective Refraction:** Auto-refractometry and manual refraction techniques.
- **Keratometry & Corneal Topography:** Assess corneal curvature for conditions like keratoconus and contact lens fitting.
- **Slit-Lamp Biomicroscopy:** Detailed assessment of the cornea, anterior chamber, and lens.
- **Anterior Segment Optical Coherence Tomography (AS-OCT):** High-resolution imaging of the cornea and anterior chamber.
- **Tear Film Analysis:** Evaluates tear breakup time (TBUT).
- **Fundus Photography:** Documents retinal and optic nerve conditions.
- **Optical Coherence Tomography (OCT):** Cross-sectional imaging for retinal diseases (e.g., macular degeneration, diabetic macular edema).
- **Fluorescein Angiography (FA):** Evaluates retinal circulation in diabetic retinopathy and vascular disorders.
- **Indocyanine Green Angiography (ICGA):** Used for choroidal conditions.
- **Ultrasound B-Scan:** For cases with media opacities (e.g., dense cataract, vitreous hemorrhage).
- **Tonometry (Goldmann, Non-contact, iCare):** Measures intraocular pressure (IOP).
- **Gonioscopy:** Assesses the drainage angle for glaucoma classification.
- **Pachymetry:** Measures corneal thickness (important for IOP interpretation).
- **Visual Field Testing (Perimetry):** Detects functional vision loss in glaucoma and neuro-ophthalmic disorders.
- **Retinal Nerve Fiber Layer (RNFL) Analysis (OCT):** Detects early glaucomatous damage.
- **Prisms test:** using of prisms bar and lose prisms.
- **Frisby test:** to detect stereo acuity.
- **Lang-I & Lang-II test:** to detects stereo acuity.

Course outline:

- **Refractive)Objective and Subjective) and optical assessment**

- **Anterior segment evaluation (included all normal sructures and lesions)**
- **Posterior segment evaluation (included all normal sructures and lesions)**
- **Glaucoma investigation (all manual tests and experties skills)**
- **Binocular vision test (all stereo tests)**

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended book:

- **Kanski 8th edition**
- **Ocular Investigation (American academy)**
- **Fiona clinical Orthoptics**

SEMESTER VIII, YEAR IV

SYLLABUS

Title: **CLINICAL ORTHOPTICS** **(OD-CORTHO 408)**

Credit Hrs: **03**

Placement: **Semester VIII, Year IV.**

Course Description:

This course provides hands-on clinical training in the assessment and evaluation of strabismus, ocular motility disorders, and binocular vision anomalies. Emphasis is placed on practical application of orthoptic examination techniques, accurate measurement of ocular deviations, and interpretation of clinical findings in pediatric and adult patients.

The course prepares students to function effectively in tertiary care and CPSP-linked hospital settings, with a focus on clinical competence, case documentation, decision-making, and referral within the professional scope of optometry.

Learning Objectives:

By the end of this course, students will be able to:

1. Develop proficiency in clinical assessment of ocular alignment and motility.
2. Apply standard and advanced orthoptic tests in real patient settings.
3. Interpret clinical findings to formulate provisional diagnoses.
4. Evaluate strabismus in pediatric, adult, and special-case patients.
5. Understand the optometrist's role in pre- and post-operative orthoptic care.
6. Maintain accurate clinical records and case documentation.

Learning Outcomes:

On completion of this course, students will be able to:

1. Perform and interpret complete orthoptic examinations.
2. Measure and record horizontal and vertical deviations accurately.
3. Assess abnormal head posture and relate it to ocular motility disorders.
4. Differentiate comitant and incomitant strabismus clinically.
5. Evaluate strabismus associated with neurological and special conditions.
6. Demonstrate clinical reasoning, appropriate referral, and professional conduct in orthoptic practice.

Course Outline:

1. Clinical History & Case Documentation

- Structured orthoptic history taking

- Symptom analysis (diplopia, asthenopia, head posture)
- Documentation standards for tertiary care settings

2. Clinical Examination of Ocular Motility

- Versions and ductions
- Assessment of comitance and incomitance
- Detection of muscle overaction and underaction

3. Assessment of Binocular Single Vision

- Sensory status at distance and near
- Fusion, suppression, and diplopia assessment
- Interpretation of findings in clinical context

4. Practical Evaluation of Strabismus

- Cover–uncover and alternate cover tests
- Measurement of deviation at distance and near
- Assessment in primary and secondary positions of gaze

5. Measurement of Squint Angle

- Prism cover test (basic and advanced application)
- Assessment of horizontal, vertical, and combined deviations
- Near–distance disparity evaluation

6. Corneal Reflex–Based Assessments

- Hirschberg test

- Krimsky and modified Krimsky test
- Clinical application in pediatric and uncooperative patients

7. Subjective Orthoptic Tests

- Maddox rod test
- Maddox wing test
- Interpretation in heterophoria and heterotropia

8. Advanced Diagnostic Techniques

- Three-step test (clinical application)
- Hess chart plotting and interpretation
- Clinical correlation with cranial nerve palsies

9. Evaluation of Abnormal Head Posture

- Observation and measurement techniques
- Relationship with muscle palsies and incomitance
- Functional significance

10. Pediatric Orthoptic Assessment

- Examination of preverbal and non-cooperative children
- Identification of pseudo-strabismus
- Screening and early referral protocols

11. Clinical Assessment of Special Conditions

- Infantile strabismus

- Alphabet pattern strabismus
- Duane's retraction syndrome and Brown's syndrome

12. Orthoptic Evaluation in Neurological Disorders

- Cranial nerve III, IV, and VI palsies
- Internuclear ophthalmoplegia (INO)
- Myasthenia gravis (clinical screening)

13. Pre- and Post-Operative Orthoptic Assessment

- Role of optometrist in surgical work-up
- Post-operative alignment assessment
- Identification of residual or consecutive deviations

14. Clinical Decision-Making & Referral

- Formulating provisional diagnosis
- Identifying red-flag signs
- Inter-professional communication and referral

15. Clinical Logbook & Case Presentation

- Supervised patient evaluation
- Case documentation and presentation
- Reflection and clinical reasoning

Evaluation Criteria:

Internal Evaluation:	**15%**
Mid-term Examination:	**15%**
Terminal Examination:	**70%**
Total:	**100%**

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Recommended Reading:

- American Academy of ophthalmology Section 6(Pediatric and Strabismus)
- Diagnosis and Management of Ocular Motility Disorders (Anson & Devis)
- Clinical Orthoptics (Fiona j rowe)

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Title: **NEUROLOGICAL EYE DISEASE-II** **(OD-NEURO 428)**
Credit Hrs: **03 (3+0)**

Placement: **SEMESTER VIII, YEAR IV.**

Course Description

This course builds upon Neurological Eye Disease – I and focuses on more complex neurological conditions affecting ocular motility, binocular vision, and higher visual function. Emphasis is placed on clinical presentation, diagnostic approach, and optometric co-management.

The course prepares students for clinical orthoptics, neuro-visual assessment, and hospital-based optometric practice.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand neurological causes of ocular motility disorders.
2. Recognize patterns of diplopia and eye movement abnormalities.
3. Correlate neurological conditions with ocular signs.
4. Develop skills in clinical evaluation and referral.
5. Integrate neurological knowledge into optometric practice.

Learning Outcomes:

On completion of this course, students will be able to:

1. Identify neurogenic ocular motility disorders.
2. Differentiate cranial nerve palsies clinically.

3. Recognize neurological causes of diplopia and nystagmus.
4. Perform structured assessment of neuro-ophthalmic cases.
5. Demonstrate safe clinical judgment and referral practices.

Course outline:

1. **Advanced Cranial Nerve Disorders** – acquired & congenital ocular motor palsies
2. **Advanced Optic Neuropathies** – compressive, hereditary, inflammatory
3. **Visual Pathway Lesions & Cortical Vision Impairment** – hemianopia, quadrantanopia
4. **Neuro-Visual Assessment Tools** – saccades, smooth pursuit, contrast sensitivity
5. **Complex Ocular Motor Disorders** – nystagmus, strabismus, diplopia management
6. **Advanced Neuro-Imaging & Electrophysiology** – OCT, VEP, MRI correlation
7. **Geriatric & Pediatric Neuro-Ophthalmology** – stroke, neurodegenerative conditions, congenital disorders
8. **Interdisciplinary Co-Management** – collaboration with neurology, neurosurgery, ophthalmology
9. **Clinical Case Management & Rehabilitation Strategies**

Evaluation Criteria:

Internal Evaluation:	**15%**
Mid-term Examination:	**15%**
Terminal Examination:	**70%**
Total:	**100%**

Recommended Books:

"Neuro-Ophthalmology Virtual Textbook" (by Dr. Miller, Open Access Online)
Link: https://www.neuro-ophthalmology-online.com

NCBI Bookshelf / PubMed Central
Free full-text books and review articles on strabismus, visual perception, and neuro-ophthalmology.
https://www.ncbi.nlm.nih.gov/books/

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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TITLE: CLINICAL LOW VISION **(**OD-CLOW 408)
CREDIT HRS: **03**
PLACEMENT: **SEMESTER VIII YEAR 4th.**

Course description:

This course is intended to provide hands-on training of eye examination to find the causes of low vision, clinical assessment of low vision and its management by optical and non-optical devices.

COURSE CONTENTS:

The overall prevalence of blindness around the globe demands for well trained Eye Care Professionals like Optometrists. The latest developments in the field of ophthalmology in ratio with the new disease condition are the greatest challenges for the Optometrists. It has been revealed that there is a strong need to provide structured training for the Optometrists.Hence, there needs to be a focus on the basics that includes to rule out the diagnosis & management of low vision. This course will primarily focus on the assessment, diagnosis & management of visual impairment. This course will focus on the management of low vision via optical or non-optical devices and special visual training.

Learning Objectives:
By the end of this course, students will be able to:

- Identify the common causes of low vision and their impact on daily life.
- Conduct comprehensive patient history-taking and interviews to assess visual impairment.
- Perform essential assessment tests and supplementary evaluations for low vision diagnosis.
- Analyze and interpret the results of color vision tests, visual field tests, and visual acuity measurements.
- Demonstrate proficiency in evaluating and prescribing low vision devices such as magnifiers, telescopes, and filters.
- Calculate and apply appropriate magnification for different optical and electronic low vision aids.
- Understand the function and application of high-tech electronic low vision devices.
- Implement environmental modifications to enhance the visual abilities of individuals with low vision.
- Develop strategies for visual training and rehabilitation tailored to individual patient needs.
- Apply knowledge of special considerations in low vision management, including psychological and social aspects.
- Demonstrate competency in prescribing and training patients in the effective use of low vision devices.

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Learning Outcomes:

- Upon successful completion of this course, students will be able to:
- Assess and diagnose low vision conditions using standardized clinical methods.
- Select and prescribe appropriate optical, non-optical, and electronic low vision devices based on individual patient needs.
- Educate patients on the proper use of low vision aids to maximize their visual potential.
- Develop and implement personalized low vision rehabilitation programs.
- Recommend suitable environmental modifications to improve the quality of life for individuals with visual impairment.
- Apply evidence-based approaches in the assessment and management of low vision cases.

Course Outline:

1. Examination of eye to evaluate the Causes of low vision
2. Patient history & interview
3. Assessment tests
4. Supplementary Tests (Color Vision, Visual Field, Visual Acuity, Magnification, Low Vision Devices)
5. EVD, EVP. Optical Devices for distance use
6. Telescopes
7. Filters
8. Optical Devices for near
9. Magnifiers and their calculations
10. Electronic and high tech low vision devices
11. Low vision enhancement system
12. Uses of low vision devices

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- **Total: 100%**
-

Recommended Reading:

1. **Primary care Low Vision – Nowakowski**
2. **Clinical Optics – American Academy of Ophthalmology**

American Academy

BHVI notes

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Title: **RESEARCH METHODS AND PRINCIPLE** **Course Code: OD-RMP 406**

Credit Hrs: **03**

Placement: **Semester VI, Year III**

Course description

This course provides students in-depth knowledge of research principles and methods. Students will be able to define research, explain and apply research term, demonstrate the research process and differentiate Qualitative and quantitative research methods, learn how to identify problem statement, develop research question and hypotheses, differentiate descriptive and analytical study design, and specify variables such as independent and dependent variables.

Course Objectives:

At the end of this course students will be able to:

- Define research and its terminology
- Know why academic research is undertaken, and the characteristics and objective of research in health care sector
- Describe quantitative, qualitative and mixed methods approaches to research
- Review literature for research purposes
- Identify and formulate researchable topic or question
- Distinguish between problem statement, research questions and objective
- Identify and discuss different types of research hypotheses
- Demonstrate and distinguish observational and experimental study design
- Define and explain the need for sampling and the advantages of various methods of sampling
- Distinguish between probability and non-probability sampling
- Writing all the spects of research individual.
- Write synopsis (intoduction, methodology, literature, inclusion/exclusion criteria)
- To make giant chart
- To make consent form (english and urdu) and importance of it.
- To code references from different search engine.
-

Course Outcomes

At the end of this course, students will:

- Understand a general definition of research and research terminologies
- Compare and Contrast Quantitative and Qualitative research approaches and use of each in a research project
- Develop skills for critical reading of research literature

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- Conduct an information search and write a literature review
- Formulate research problem and question and justify the research questions
- Explain the applicability of various research approaches and methodologies
- Develop competencies to identify and use probability and non-probability sampling technique and strategies and method for academic research
- Identify study type and study design from title of research.
- Use different search engine and collect useful information
- Writing skills improvement specially in thesis
- To make consent forms both english and urdu and how it fill
- Understance which test will applied in data analysis
- Analysis data with using SPSS software and how variables code

CONTENTS:

- Research and its terminology
- Research Objectives
- Variables
- Quantitative Research
- Qualitative Research
- Review literature
- Researchable topic or question
- Issues in public health research
- Problem statement
- Research questions
- Research hypotheses
- Observational study design
- Experimental study design
- Sampling Techniques
- Probability and non-probability sampling
- Writing skills
- Writing a research purpose protocols
- Search engine
- Consent form
- Quarterly work load and writing distribution (Giant chart)
- References and its importance
- SPSS version 21 software

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%

- Total: 100%

Strategies: Interactive lectures, presentations and group discussion.

Recommended books

- **Research methodology: a step-by-step guide for beginners by Ranjit Kumar (Fifth Edition)**
- **Research methodology for Health Professionals by RC Goyal (First Edition)**
- **Epidemiology by Leon Gordis. Imprint: Saunders (Fifth Edition**)

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
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Title: OPTICAL SHOP AND INDUSTRY MANAGEMENT (OPT-609)

Credit Hrs: 03

Placement: SEMESTER VIII, YEAR IV.

Course Description:
This course introduces students to the principles of managing an optical business, covering entrepreneurship, business setup, operations, and market analysis. Students will learn strategies for effective shop management, industry evaluation, and decision-making using business tools like SWOT, PEST, and Porter's Five Forces. The course combines theoretical knowledge with practical insights to prepare students for successful management in the optical industry.

Learning Objectives:

- Understand the fundamentals of business management and entrepreneurship in optics.
- Plan and set up an optical shop, including operations and resource management.
- Identify and manage key aspects of shop operations and customer needs.
- Analyze the optical industry and market using standard assessment tools.
- Apply SWOT, PEST, and Five Forces analysis to strategic business decisions.
- Understand the industry life cycle and its impact on optical business strategy.
- Develop skills for running a sustainable and profitable optical practice.
- Integrate business knowledge with practical decision-making in optics.

Learning Outcomes:
Upon completion, students will be able to:

- Establish and manage an optical shop effectively.
- Apply industry and market analysis for strategic planning.
- Use business tools to evaluate opportunities, risks, and competitive environment.
- Optimize shop operations, resource allocation, and customer satisfaction.

- Make informed, evidence-based decisions for sustainable optical business growth.

Course Content:

A. Basics of Management

- Fundamentals of management and entrepreneurship
- Optical business setup and operations
- Shop management, key aspects, and needs analysis

B. Industry and Market Assessment

- Industry analysis and market evaluation
- SWOT analysis for business strategy
- PEST analysis of external factors
- Porter's Five Forces analysis
- Industry life cycle and its business implications

Evaluation Criteria:

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	**100%**

Recommended text book:
Notes, pdf, powerpoint given by facilitator

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **CLINICAL CONTACT LENS** **(**OD-CLEN 408)
Credit Hrs: 03 (0+3)
Placement: **Semester VIII, Year IV.**

Course Description:

This course provides students with practical, **self-directed training in the assessment, fitting, and management of specialized contact lenses**, including keratoconus, scleral, and orthokeratology (Ortho-K) lenses. Students will **review clinical cases, make assessed decisions, and evaluate multiple-choice options** (one correct and three distractors), followed by recommended management and treatment guidance. Each student will document and submit **clinical cases in a structured logbook**, demonstrating competence in lens fitting, patient management, and clinical record-keeping. Upon completion of **12 case series**, students will receive a certificate confirming successful completion.

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Learning Objectives

By the end of this course, students will be able to:

1. **Explain emmetropization and myopia development**
   Describe the physiological mechanisms of emmetropization.
   Discuss environmental, genetic, and optical factors contributing to myopia progression.

2. **Evaluate myopia control strategies**
   Compare evidence-based methods of myopia control, including optical, pharmacological, and behavioral interventions.select appropriate management strategies based on patient age, risk factors, and clinical presentation.

3. **Select appropriate contact lenses for complex cases**
   Identify indications and contraindications for RGP, scleral, orthokeratology, and therapeutic/bandage lenses.
   Match lens design and material properties to corneal and ocular surface conditions.

4. **Perform clinical assessment for specialty lens fitting**
   Interpret corneal topography, keratometry, and slit-lamp findings.
   Assess ocular health and suitability for specialty contact lens wear.

5. **Demonstrate competency in contact lens fitting**
   Apply fitting principles for RGP, scleral, Ortho-K, and therapeutic lenses.
   Evaluate lens fit, movement, centration, and patient comfort.
   Modify lens parameters based on clinical findings.

6. **Develop clinical decision-making skills**
   Analyze patient cases and formulate individualized management plans.
   Justify lens selection and treatment choices using clinical evidence.

7. **Monitor treatment outcomes**

Conduct follow-up assessments and identify complications or adverse responses.
Adjust management plans to optimize visual and ocular health outcomes.

8. **Document clinical cases professionally**
   Record comprehensive patient history, examination findings, lens selection rationale, and follow-up outcomes.
   Present structured case reports using standardized logbook documentation.

9. **Demonstrate professional and ethical practice**
   Communicate effectively with patients regarding treatment options and expectations.
   Ensure safe, patient-centered care and adherence to clinical guidelines.

Learning Outcomes:

- Develop proficiency in lens selection and fitting for complex cases.
- Enhance clinical decision-making and problem-solving skills.
- Gain experience in structured case documentation and professional reporting.

Course outline:

Myopia management:

F1 Emmetropization in the Context of Myopia
F2 Methods of Controlling Myopia
F3 Contact Lenses for Myopia Control

1. **Self-Directed Case Series:**

Students review **realistic clinical cases** of patients requiring contact lenses.
Make **assessed decisions** regarding lens selection, fitting, and management.

Recommended management and treatment options are provided after assessment.

2. **Types of Contact Lenses Covered:**
    - **Rigid Gas Permeable (RGP)** for keratoconus or irregular corneas
    - **Scleral Lenses** for severe corneal irregularities or ocular surface disease
    - **Orthokeratology (Ortho-K) Lenses** for myopia control and corneal reshaping
    - Therapeutic/Bandage lenses as applicable
3. **Case Documentation:**
   Students submit cases in a **structured logbook**, including:
    - Patient history and demographics
    - Clinical findings (corneal topography, keratometry, slit-lamp exam)
    - Lens selection and fitting rationale
    - Follow-up and patient outcomes
4. **Assessment and Completion:**
    - Completion of **12 case series**
    - Submission of **logbook with documented cases**
    - Certificate awarded upon successful completion

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended Reading:

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DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

1. **International Association of Contact Lens Educators. (2026). Title of Module or Module Number. ICLC 2026 Module.**
2. **Clinical Procedures in Primary Eye Care - Dave Elliott's**
3. **The Contact Lens Manual – Andrew Gasson**
4. **Contact Lenses – Ken Deniels**
5. **Contact Lens Practice - Robert B Mandell**
6. **Contact lens manual**

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

SEMESTER IX , YEAR V

Title: **VISUAL PERCEPTION & NEUROPHYSIOLOGY – I (OD-VPAN 619)**
Credit Hrs: **03 (3+0)**

Placement: **SEMESTER IX, YEAR V.**

Course Description:

This course introduces the neurophysiological foundations of vision and visual perception, focusing on the structure and function of the visual pathway from retina to visual cortex. Emphasis is placed on sensory processing, cortical organization, and perceptual mechanisms underlying normal vision.

The course builds a scientific basis for understanding visual function, binocular vision, and higher visual processing, preparing students for advanced clinical interpretation of neurological and perceptual visual disorders.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand the neurophysiology of the visual system.
2. Explain retinal and cortical processing of visual information.
3. Describe visual pathway organization and functional specialization.
4. Relate neural mechanisms to visual perception.
5. Build a foundation for clinical interpretation of visual disorders.

Learning Outcomes

On completion of this course, students will be able to:

1. Describe the structure and function of the visual pathway.
2. Explain neural processing at retinal and cortical levels.
3. Differentiate visual pathways and their functional roles.
4. Relate cortical processing to binocular vision and perception.
5. Apply neurophysiological concepts to basic clinical scenarios.

Course outline:

1. Organization of the visual system
2. Retinal neurophysiology and phototransduction
3. Retinal ganglion cells and receptive fields
4. Lateral geniculate nucleus (LGN)
5. Primary visual cortex (V1): structure and function
6. Cortical receptive fields and visual maps
7. Magnocellular, parvocellular, and koniocellular pathways
8. Binocular interaction at cortical level
9. Development of visual system and critical periods
10. Plasticity of the visual cortex

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

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Recommended Books:

"Visual Neuroscience" – Open Access (MIT / UBC)

Link: Visual Neuroscience – MIT OpenCourseWare

"Neuro-Ophthalmology Virtual Textbook" (by Dr. Miller, Open Access Online)
Link: https://www.neuro-ophthalmology-online.com

NCBI Bookshelf / PubMed Central
Free full-text books and review articles on strabismus, visual perception, and neuro-ophthalmology.
https://www.ncbi.nlm.nih.gov/books/

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Title: **COMMUNITY OPHTHALMOGY** **(**OD-COPH 600

Credit Hrs: 03 (2+1)

Placement: **SEMESTER IX, YEAR V.**

Course Description:

This course is designed for bachelor's students having their second exposure to ___. It contains comprehensive series of lectures on dispensing optics. It introduces the students to different lenses & its dispensing. This course provides a strong foundation of lens, glasses & its dispensing so that it is helpful in future clinics courses.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand key definitions and concepts related to primary eye care and public health.
2. Explain the epidemiology of eye diseases and the importance of early detection through screening.
3. Recognize the significance of the "Health for All" initiative and its relevance to eye care.
4. Describe the structure and components of primary health care (PHC) and primary eye care (PEC).
5. Identify the essential elements and principles of primary health care in relation to eye health.
6. Analyze the role of primary health care workers in delivering effective eye care services.
7. Understand the integration matrix and its application in community-based eye care programs.
8. Develop strategies for health education and promotion to prevent vision-related diseases.
9. Apply community mobilization and participation techniques to enhance eye health initiatives.

Course Outline:

1. **BASICS DEFINITIONS**
2. **EPIDEMILOGY**
3. **SCREENING**
4. **HEALTH FOR ALL**
5. **PRIMARY HEALTH CARE AND PRIMARY EYE CARE**
6. **ESSENTIAL ELEMENT OF PRIMARY HEALTH CARE**
7. **PRINCIPALS OF PRIMARY HEALTH CARE**
8. **ROLE OF PRIMARY HEALTH WORKER IN EYE CARE**
9. **INTEGRATION MATRIX**
10. **HEALTH EDUCATION AND PROMOTION**
11. **COMMUNTY MOBILIZATION AND PARTICIPATION**

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Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Demonstrate a foundational understanding of primary health care and its role in eye care.
2. Assess the epidemiology of eye diseases and implement screening techniques in community settings.
3. Apply primary health care principles in designing and delivering eye care services.
4. Educate communities on the importance of eye health through health promotion and awareness campaigns.
5. Collaborate with primary health care workers to integrate eye care into general health services.
6. Develop and implement community-based strategies to improve access to eye care services.
7. Engage in community mobilization efforts to enhance participation in eye health programs.
8. Exhibit competency in managing and promoting public health initiatives for vision care.

Evaluation Criteria:

Internal Evaluation:	40%
Mid-term Examination:	20%
Terminal Examination:	40%
Total:	**100%**

Recommended Reading:

The Principles and Practice of Community Ophthalmology
G. V. S. Murthy

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Course: GERIATRIC OPTOMETRY Course Code: 0D-GCO 509

Credit Hrs: 03 (3+0)

Placement: YEAR-5: SEMESTER IX

Course Description:

This course is designed to provide the student with comprehensive instructions which will guide the students to take appropriate visual care of the elderly..

Course Objectives:

On successful completion of the module the student should be able to understand the assessment and management of visual impairment and relative disability due to the aging of the eye.

By the end of the module the student should be able to:
• Describe the effects of ageing on the eye and on the patient
• Perform a pertinent geriatric optometric assessment
• Manage patients with age-related visual impairment.

Learning Outcomes:
On successful completion, students will:

- Perform comprehensive geriatric eye examinations
- Identify and manage age‑related ocular diseases
- Modify examination techniques for elderly patients
- Co‑manage geriatric patients with ophthalmologists and healthcare teams
- Recommend low‑vision and rehabilitative interventions

Course Content Outline:

Introduction to geriatric optometry

• Theories of ageing

• The ageing eye

• Sensory losses with ageing

• Cognitive losses with ageing

• Anatomical and physiologic changes in ageing

• Pharmacological and nutritional issues in the elderly

• Caring for the elderly

- **Comprehensive Geriatric Eye Examination**
- **Geriatric syndromes**
- **Scaled assessment of the elderly**

Teaching and Learning Methods:
Interactive lectures and clinical case-based learning
Clinical rotations in Ophthalmology diagnostic units
Research and data interpretation exercises

Assessment Methods:

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Recommended Textbooks & References:

1. • Brien Holden Vision Institute. Global Optometric Resource Modules, Brien Holden Vision Institute; 2014.
2. • Rosenbloom A, Rosenbloom & Morgan's, Vision and Aging, Butterworth-Heinemann, 2007.
3. •The Aging eye: preventing and treating disease. Harvard Medical School Special Health Report. Harvard Health Publications. ; 2001.
4. • Edward Claflin: Age protectors; Rajendra Publishing Home Pvt Ltd., Mumbai, 1998

Recommended texts

1. • Hirsch M J & Wick R E : Vision of the Ageing Patient, (An Optometric symposium), Hammond, Hammond & Company Limited, London; 1960
2. • D.E Roseblatt, V.S Natarajan. Primer on Geriatric care – A Clinical Approach to the Older Patient, Pixel publications,2002.

DOW INSTITUTE OF MEDICAL TECHNOLOGY
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DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Course Name: Advanced Dispensing Course Code: OD-ADIS 509

Credit Hours: 3 (0+3)

Placement: YEAR-5: SEMESTER IX

Course Description

This is a hands-on, clinically oriented practical course designed to develop advanced ophthalmic dispensing skills. Emphasis is placed on real-world spectacle dispensing, advanced measurements, lens and frame selection, fitting, troubleshooting, and patient counseling, in line with international Doctor of Optometry (OD) practical training standards.

Course Objectives

After completing this course, students will be able to:

1. Perform advanced dispensing measurements accurately
2. Select and fit appropriate lenses and frames for complex cases
3. Troubleshoot non-tolerance and adaptation problems
4. Demonstrate ethical, patient-centered dispensing practices
5. Detect face symmetry and suitable frame selection
6. Analytical calculations
7. Manual neutralisation and Lensometry

Learning Outcomes

On successful completion, students will:

- Independently dispense spectacles for diverse visual needs
- Perform precise fitting, adjustment, and verification of eyewear
- Resolve patient complaints related to spectacle wear
- Maintain quality control according to international standards

CONTENT

1. Advanced Dispensing Instruments & Tools

Use of pupillometer, digital centration devices, lensometers, frame heaters, and adjustment tools.

2. Advanced Dispensing Measurements

Monocular PD, fitting height, vertex distance, pantoscopic tilt, wrap angle using manual and digital methods.

3. Progressive Addition Lens (PAL) Dispensing

PAL verification; fitting cross alignment; corridor selection; adaptation counseling.

4. Frame Selection & Facial Analysis

Facial anatomy assessment; frame material selection; balance, comfort, and aesthetics.

5. Frame Adjustment & Repairs

Temple and bridge adjustments; nose pad alignment; minor repairs and maintenance.

6. Specialty & Occupational Eyewear

Computer glasses; sports eyewear; safety eyewear; pediatric dispensing techniques.

7. Lens Treatments & Verification

Verification of coatings, polarization, photochromic response; ANSI/ISO tolerance checks.

8. Troubleshooting & Non-Tolerance Management

Identifying causes of discomfort; prismatic errors; remake decision-making; patient reassurance.

9. Patient Counseling & Ethical Dispensing

Explaining lens options; managing expectations; ethical sales practices; documentation.

10. Quality Control & Practice Workflow

Spectacle verification checklist; record keeping; coordination with labs; infection control.

11. **Prescription Analysis**

To find out the glass power from distance, near and intermediate prescriptions

12. **Frame standard alignment and repairs**

13. Prescribe ophthalmic lens

14. Spectacle delivery -on-eye verification

15. Progressive lens: Prescribe, dispensing, delivery, troubleshooting,

Assessment & Evaluation (Practical-Based)

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Reference Reading

1. **Brooks CW, Borish IM. *System for Ophthalmic Dispensing*. utterworth-Heinemann.**
2. **Jalie M. *Ophthalmic Lenses & Dispensing*. Elsevier.**
3. **ANSI Z80 / ISO Ophthalmic Optics Standards.**
4. **World Council of Optometry (WCO). *Clinical Dispensing Competencies*.**

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

ADVANCED CLINICAL OPTOMETRY-I (Practical)

Course Code: OD-ACR 519
Credit Hours 03 (0+3)
YEAR-5: SEMESTER IX

Course Description

Advanced Clinical Optometry-I is a fully practical, senior clinical course focusing on independent primary eye care under supervision. Students manage real patients, integrating advanced diagnostic skills, clinical reasoning, ocular disease detection, and evidence-based management consistent with international Doctor of Optometry (OD) standards.

Course Objectives

Students will be able to:

1. Independently conduct comprehensive eye examinations
2. Diagnose and manage refractive, binocular, and early ocular disease cases
3. Apply advanced clinical reasoning and ethical decision-making
4. Maintain professional clinical documentation and communication

Learning Outcomes

On completion, students will:

- Perform full-scope primary eye care independently
- Formulate differential diagnoses and management plans
- Manage common and moderately complex optometric cases
- Demonstrate professionalism and patient-centered care

Clinical Content

1. Independent comprehensive eye examination
2. Advanced refraction and presbyopic management
3. Binocular vision and accommodative disorder management
4. Anterior segment disease assessment
5. Posterior segment evaluation and imaging interpretation
6. Ocular disease identification and referral protocols

7. Applied clinical pharmacology (diagnostic agents)
8. Clinical decision-making and case discussions
9. Clinical documentation and medico-legal practice
10. Patient communication, ethics, and safety

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Reference Reading

- Elliott DB. *Clinical Procedures in Primary Eye Care*. Elsevier
- Kanski JJ, Bowling B. *Clinical Ophthalmology*. Elsevier
- AOA Clinical Practice Guidelines
- WCO Global Competency Framework

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

SEMESTER X , YEAR V

Title: **VISUAL PERCEPTION & NEUROPHYSIOLOGY –II (OD-VPAN 620)**
Credit Hrs: **03 (3+0)**

Placement: **SEMESTER X, YEAR V.**

Course Description:

This course advances the study of visual perception by focusing on higher cortical processing, visual cognition, and perceptual interpretation. Emphasis is placed on motion, depth, color, form, attention, and visuospatial processing, along with clinical correlations of neurological and perceptual visual disorders.

The course prepares OD graduates to recognize and interpret complex visual perceptual dysfunctions encountered in neuro-ophthalmology, pediatrics, and rehabilitation settings.

Learning Objectives:

By the end of this course, students will be able to:

1. Understand higher-level visual perception mechanisms.
2. Explain cortical integration of visual information.
3. Recognize perceptual visual disorders of neurological origin.
4. Correlate visual perception deficits with clinical findings.
5. Develop insight into visual rehabilitation and referral needs.

Learning Outcomes:

On completion of this course, students will be able to:

1. Explain advanced visual perception processes.

2. Differentiate dorsal and ventral stream dysfunctions.
3. Identify perceptual visual disorders related to cortical damage.
4. Interpret clinical signs of higher visual dysfunction.
5. Demonstrate clinical reasoning in neuro-visual case scenarios.

Course Outline:

1. Extrastriate visual cortex (V2–V5)
2. Dorsal ("where") and ventral ("what") visual streams
3. Motion perception and optic flow
4. Depth perception and stereopsis
5. Color vision processing at cortical level
6. Form, pattern, and object recognition
7. Visual attention and eye–brain interaction
8. Visual perception and spatial orientation
9. Visual agnosias and perceptual disorders
10. Cortical visual impairment (CVI)
11. Visual perception in neurological disorders
12. Clinical assessment of perceptual visual dysfunction

Evaluation Criteria:

- Internal Evaluation: 15%
- Mid-term Examination: 15%

- Terminal Examination: 70%
- Total: 100%

Recommended books:

"Visual Neuroscience" – Open Access (MIT / UBC)

Link: Visual Neuroscience – MIT OpenCourseWare

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

Course : Advance Ocular Investigation

Course Code: OD-AOIN 620

Credit Hrs: 03 (2+1)

Placement: SEMESTER X, YEAR V.

Course Description:

This course is designed to provide advanced knowledge and hands-on experience in ocular diagnostic technology, imaging systems, and specialized investigative procedures used in ophthalmic and optometric practice. Students will develop the ability to interpret complex diagnostic data, correlate findings with ocular and systemic diseases, and contribute to differential diagnosis and patient management.

Course Objectives:

At the end of this course, students will be able to:

1. Explain the principles and clinical applications of advanced ocular imaging and diagnostic technologies.
2. Perform advanced ocular investigations accurately and interpret the results critically.
3. Correlate ocular investigative findings with systemic and ocular diseases.
4. Understand the role of modern technology and artificial intelligence in ocular diagnostics.
5. Maintain high standards of clinical data interpretation, documentation, and reporting.

Learning Outcomes:

By the end of the course, students will be able to:

1. Perform advanced ocular imaging and investigative procedures confidently.
2. Interpret OCT, angiography, perimetry, and electrophysiological results.
3. Correlate diagnostic findings with clinical ocular and systemic conditions.
4. Apply AI-assisted analysis tools in ocular diagnostics.
5. Integrate data from multiple tests to aid clinical decision-making and patient care.

Course Content Outline:

Unit 1: Advanced Corneal and Anterior Segment Imaging

- Scheimpflug imaging (Pentacam) – corneal tomography, anterior chamber depth, angle measurement
- Anterior Segment OCT – cross-sectional imaging and analysis
- Specular microscopy – corneal endothelial assessment

- Confocal microscopy – corneal cell morphology
- Corneal biomechanics (Ocular Response Analyzer, Corvis ST)

Unit 2: Posterior Segment and Retinal Imaging

- Optical Coherence Tomography (OCT) – macular, optic nerve, and retinal nerve fiber layer analysis
- OCT-Angiography (OCT-A) – vascular assessment in macular and optic nerve diseases
- Fundus fluorescein angiography (FFA) and Indocyanine green angiography (ICGA)
- Scanning Laser Ophthalmoscopy (SLO)

Unit 3: Electrophysiological Investigations

- Electroretinography (ERG) – full-field, multifocal, and pattern ERG
- Electrooculography (EOG)
- Visual Evoked Potentials (VEP)
- Clinical applications in optic neuropathies, retinal dystrophies, and neuro-ophthalmic disorders

Unit 4: Advanced Glaucoma and Visual Field Assessment

- Automated perimetry (Humphrey) – advanced analysis, progression interpretation
- Optic disc and RNFL imaging in glaucoma

Unit 5: Ocular Biometry and Refractive Surgery Diagnostics

- Optical biometry (IOL Master, Lenstar)
- Wavefront aberrometry – measurement and analysis of higher-order aberrations
- Corneal topography in refractive surgery planning
- Pachymetry and keratometry in LASIK evaluation

Unit 6: Ocular Surface and Tear Film Evaluation

- Meibography and LipiView systems
- Non-invasive tear breakup time (NIBUT)
- Osmolarity testing and ocular surface inflammation markers

Unit 7: Systemic Disease Correlation and Imaging

- Interpretation of ocular signs in diabetes, hypertension, thyroid eye disease, and neurological disorders
- Imaging protocols for ocular manifestations of systemic disease

Unit 8: Artificial Intelligence and Digital Imaging

- Introduction to AI algorithms in retinal disease screening (e.g., DR, AMD, glaucoma)

Unit 09: Interpretation and Reporting

- Integration of multiple investigative findings for differential diagnosis
- Standardized reporting formats (OCT, perimetry, angiography)
- Clinical correlation and case discussion

Teaching and Learning Methods:

- Interactive lectures and clinical case-based learning
- Demonstrations and imaging workshops
- Supervised practice on diagnostic instruments (OCT, FFA, Topographer, Perimeter)
- Clinical rotations in Ophthalmology diagnostic units
- Research and data interpretation exercises

Assessment Methods:

- Internal Evaluation: 15%
- Mid-term Examination: 15%
- Terminal Examination: 70%
- Total: 100%

Recommended Textbooks & References:

1. Kanski JJ & Bowling B. *Clinical Ophthalmology: A Systematic Approach*, 9th Ed.
2. Spaeth GL et al. *The Glaucoma Atlas*, 3rd Ed.
3. Ryan SJ. *Retina*, Vol. 1–5, 6th Ed.
4. Elliott DB. *Clinical Procedures in Primary Eye Care*, 5th Ed.
5. Chen FK & Holz FG. *Optical Coherence Tomography in Age-Related Macular Degeneration and Diabetic Retinopathy*.
6. UNSW Optometry: OPTM4311 – Ocular Disease 4 (Advanced Ocular Imaging & Diagnostics).
7. AAO (American Academy of Ophthalmology) Diagnostic Imaging Modules.

DOW INSTITUTE OF MEDICAL TECHNOLOGY
DOCTOR OF OPTOMETRY
DOW UNIVERSITY OF HEALTH SCIENCES, KARACHI

ADVANCED CLINICAL OPTOMETRY-II (Practical)

Course Code: OD-ACR 620
Credit Hours: 03(0+3)
Placement: YEAR-5: SEMESTER X

Course Description

Advanced Clinical Optometry-II is a clinical course emphasizing management of complex and high-risk cases, specialty clinic exposure, co-management with ophthalmology, and leadership in clinical decision-making. The course prepares students for full-time internship and independent practice in alignment with international OD programs.

Course Objectives

Students will be able to:

1. Manage complex ocular disease and specialty cases under supervision
2. Integrate advanced diagnostics and evidence-based therapeutics
3. Demonstrate leadership and clinical autonomy in patient care
4. Collaborate effectively within interdisciplinary eye-care teams

Learning Outcomes

On completion, students will:

- Manage advanced and complex optometric cases
- Utilize advanced diagnostic technologies confidently
- Co-manage patients with ophthalmologists appropriately
- Demonstrate readiness for internship and professional practice

Clinical Content

1. Advanced ocular disease clinics (glaucoma, DR, AMD)
2. Neuro-optometric and binocular vision case management
3. Post-surgical and post-trauma visual care
4. Advanced contact lens and specialty lens clinics
5. Low vision and rehabilitation case management
6. Pediatric and geriatric specialty clinics
7. Ocular emergencies and red-flag triage
8. Advanced diagnostic technology (OCT, VF, imaging)
9. Clinical audit, quality assurance, and reflective practice
10. Leadership, ethics, and interdisciplinary co-management

Assessment & Evaluation

Internal Evaluation:	15%
Mid-term Examination:	15%
Terminal Examination:	70%
Total:	100%

Reference Reading

- Elliott DB. *Clinical Procedures in Primary Eye Care*. Elsevier
- Kanski JJ, Bowling B. *Clinical Ophthalmology*. Elsevier
- AAO / AOA Co-management Guidelines
- WCO Advanced Competency Standards