CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

SCHOOL OF PARAMEDICS & ALLIED HEALTH SCIENCES

Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

MASTER OF OPTOMETRY

2021

COURSE SYLLABUS

Programme structure

BASKET 1	BASKET 2	BASKET 3	BASKET 4	
School Core Courses	**Discipline Core Courses**	**Ability Enhancement Compulsory Course (AECC)** To be selected from University Basket	**Skill Courses** (To be selected from University Basket)	
SC-1 SC-2 SC-3	DC-1 DC-2 DC-3 DC-4 DC-5 DC-6 DC-7 DC-8 DC-9 DC-10 DC-11 DC-12 DC-13 DC-14 DC-15 DC-16	AECC-1 AECC-2 AECC-3	SFS-1 SFS-2 SFS-3	**TOTAL CREDITS**
10 Credits	**68 Credits**	**6 Credits**	**12 Credits**	**96 Credits (Minimum Credits required)**

BASKET I
School Core Courses

Sl. No.	CODE	SUBJECT	SUBJECT TYPE (T+P+Pj)	CREDITS
SC-1	CUTM1721	Research Methodology	2+0+1	3
SC-2	CUTM1958	Business and Clinical Aspects of Optometry	2+0+1	3
SC-3	CUTM1959	Recent Advancement in Optometry	2+0+2	4

BASKET II

Discipline Core Courses

Sl. No.	CODE	SUBJECT	SUBJECT TYPE (T+P+Pj)	
DC-1	CUTM1960	Applied Optometric Optics	2+2+0	4
DC-2	CUTM1961	Advanced Ophthalmic Diagnostic Procedures & Instrumentation	2+2+0	4
DC-3	CUTM1962	Epidemiology and Community Optometry	2+0+1	3
DC-4	CUTM1963	Introduction to LASER Technology	1+0+2	3
DC-5	CUTM1964	LASER in Refractive Surgery	1+0+2	3
DC-6	CUTM1965	Orthoptics and Vision Therapy	2+2+0	4
DC-7	CUTM1966	Advanced contact lens practice -I	2+2+0	4
DC-8	CUTM1967	LASER in Anterior segment disorders & Glaucoma	1+0+3	4
DC-9	CUTM1968	Paediatric Optometry and binocular Vision I	2+1+0	3
DC-10	CUTM1969	LASER in Posterior segment disorders	1+0+2	3
DC-11	CUTM1970	Paediatric Optometry and Binocular Vision II	2+1+0	3
DC-12	CUTM1971	Advance contact lens practice II	2+2+0	4

DC-13	CUTM1972	Ocular diseases & Therapeutics	2+0+1	3
DC-14	CUTM1973	Neuro Optometry	2+1+0	3
DC-15	CUTM1974	Specialty Clinic	0+10+0	10
DC-16	CUTM1975	Dissertation	0+0+12	12

NOTE: Along with the School core and Disciple core subjects, the students need to opt for AECC Courses, Skill/ Domain/ Elective courses and value- added courses from the University Basket, as per the norms of the University.

Applied Optometric Optics

Subject Name	Code	Type of Course	T+P+Pj	Credits
Applied Optometric Optics		Theory + Practice	2+2+0	4

Description

This course deals with application of optical properties of light, eye as a visual system and advanced dispensing techniques.

Course Outcome

1. Understanding the fundamental optical properties of eyes and lighting system with focus on learning the special optical techniques involved.
2. Understanding the advance and detailed procedure of ophthalmic lens dispensing technique along with idea about the specialty lens and frames dispensing.

MODULE: **I**

Clinical Optics: 1. The eye as an optical system 2. Measurements of the optical constants of the eye. 3. Correction of Ametropia.

MODULE: II

Applied visual optics: 1. Aberration and ophthalmic lens. 2. Clinical aberrometry. Optics of refractive surgery. Wave front-guided refraction and treatments. 3. Optical principles of Low vision and contact lens Dispensing Optics.

MODULE: III

Applied Dispensing Optics: 1. Measuring Monocular & binocular PDs both distance & near with PD Ruler, Pupillometer, Dot method 2. Spectacle lenses (characteristics of lens materials, ISI standards for ophthalmic lens, Lens design) 3. Prism (Properties & uses in optometry) 4. Lens surfacing & quality (principles of lens surface generation, glass assessment, faults in lens materials & lens surface, inspection of lens quality)

MODULE: IV

Applied Dispensing Optics: 1. New generation ophthalmic lens materials. 2. Lens for special uses- Fresnel lenses, thin-lite lenses, aspheric, hi-index, absorptive & protective & photochromatic lenses, high refractive error lenses. 3. Anisometropia and aniseikonia. 4. Absorptive lenses and coatings.

MODULE: V

Applied Dispensing Optics: 1. Progressive addition lenses (designs, marking & fitting, trouble shooting) 2. Spectacle frames (designs, materials, types, measurements & marking) 3. Dispensing aids (latest instruments, organization of dispensing counter, cosmetic & functional dispensing, final checking, adjustments & dispensing prescription spectacle, patient education on handling of spectacle lenses, trouble shooting) 4. Ophthalmic Prisms and decentration.

Practice:

1. CL fitting: RGP and Soft CL
2. IPD measurement: Manual and automated
3. Ophthalmic lens markings: Optic centre finding, Bi-focal marking
4. PAL design
5. Retinoscopy to find out final lens Rx: Static and Dynamic retinoscopy

Suggested Books: 1. Optics of human eye – Smith Etchision. Butterworth Heinemann.
2. Clinical optics – BUDD APPLETON. Butterworth Heinemann 3. Spectacle Lenses – Theory and practice – Coling Fowler, Butterworth Heinemann. 2. Ophthalmic Lenses and dispensing – M.Jalie, Butterworth Heinemann.

Advanced Ophthalmic Diagnostic Procedures & Instrumentation

Subject Name	Code	Type of Course	T+P+Pj	Credits
Advanced Ophthalmic Diagnostic Procedures & Instrumentation		Theory + Practice	2+2+0	4

Description

This subject deals with advance practice of ophthalmic instruments, their handling procedures and clinical application.

Course Outcome

The objective of this course is to equip the students with a thorough knowledge of ophthalmic instruments. At the end of this course, students will be able to:
1. perform all the ophthalmic instrumentation procedures and know about their appropriate clinical uses.

MODULE: I

1. Refraction instruments (designs & features of standard test charts, trial frame & Phoropter units manual & automated) 2. Slit lamp Biomicroscope (designs & features, application).

MODULE: II

1. Tonometers (designs & features, application) 2. Anterior segment diagnostics- Corneal topography (videokeratography, Specular microscopy, Corneal Hysteresis, Aberometry & Pentacam, ORB scan)

Practice: GAT, Schiotz, NCT

MODULE: III

1. Glaucoma diagnostics – Gonioscopy, computerized Visual field analysis (Perimetry) 2. Electro diagnostics 3. Orthoptic instruments used in assessment & management of binocular vision disorders.

Practice: HFA, Visual confrontation Test.

MODULE: IV

1. Posterior segment diagnostics (ERG, EOG, VER, FFA, OCT, HRT, GDx, ONH evaluation, fundus photography) 2. Lensometer (designs & features) 3. Binocular indirect Ophthalmoscopy

Practice: Manual and Automated Lensometer

MODULE: V

1. Cataract evaluation 2. Colour vision devices 3. Ultrasonography

Practice: Colour Vision Test

MODULE: VI

1. SPECIAL INSTRUMENTS & TESTS: Brightness acuity test, Vision analyzer, Pupilometer, Video acuity test, Potential Acuity Meter, Aberrometer

Textbooks:

1. Optometric Instrumentation: David Hensen
2. Diagnostics and imaging techniques in Ophthalmology: Amar Agarwal
3. James Wolffsohn: Eye Essentials Ophthalmic Imaging
4. Mark Brezinski: Optical Coherence Tomography: Principles and Applications
5. Benjamin F.Boyd : Wavefront analysis aberrometers and corneal topography
6. Arun D.Singh :Ophthalmologic Ultrasound, An Issue of Ultrasound Clinics,vol 3.

Epidemiology and Community Optometry

Subject Name	Code	Type of Course	T+P+Pj	Credits
Epidemiology and Community Optometry		Theory + Project	2+0+1	3

Description

Epidemiology and Community Optometry deals with study about the worldwide prevelance of common eye disorders and their epidemiological data. Along with it the course focuses on understanding the community practices in optometry.

Course Outcome

1. Understanding the fundamentals of epidemiology and its types.
2. Understanding what are the epidemiological prevelance of common eye disorders worldwide.
3. Understanding the community service procedure in optometry.

MODULE: I

1. Epidemiology of Blinding Eye Diseases, Skills for Field Projects in Eye Care, 2. Eye Care Programmes
3. Basic Epidemiology, Methodology, Basics of Epidemiology study methods, Types of study designs, Screening for visual disorders, Childhood blindness, Refractive errors and presbyopia, Age related cataract, Low Vision, Diabetic retinopathy, glaucoma, Age related Macular Degeneration, Vitamin A deficiency.

MODULE: II

1. Corneal and external diseases- Prevention strategies 2. Introduction to Health Economics. 3. Childhood Eye Disease and Ocular Infections

MODULE: III

1. How to Plan and Implement a VISION 2020: The Right to Sight project 2. Skills, Resources and Technology for VISION 2020: The Right to Sight, Proposal Development.

MODULE: IV

1. Analyzing Survey & Population Data; Health Systems
2. Sociological approaches to Health. 3. Comparative studies of health care system
4. Optometry in a multi-disciplinary health care system 5. Quality assurance in health care 6. Roles & responsibilities of community health optometrist.

MODULE: V

1. Demography & Epidemiology of occupational eye disease & injuries
2. Communicable & Non-communicable Eye diseases, modes of disease transmission. 3. Health problems in India (types, cause, management)
4. Social issues & optometric involvement, law & ethics

MODULE: VI

1. National Health Programs & role of optometrist. 2. Various national health & community eye program. 3. National health & eye care policies- Vision 2020 The Right to Sight 4. Role of optometrist in national health programs for prevention of blindness.

Project:
1. Vision 2020 epidemiological data analysis
2. Presentation on role of NPCB and IAPB

Text Book:
1. GVS Murthy, S K Gupta, D Bachani: The principles and practice of community Ophthalmology, National programme for control of blindness, New Delhi, 2002 2. Newcomb RD, Jolley JL : Public Health and Community Optometry, Charles C Thomas Publisher, Illinois, 1980 3. K Park: Park's Text Book of Preventive and Social Medicine, 19th edition, Banarsidas Bhanot publishers, Jabalpur, 2007 4. MC Gupta, Mahajan BK, Murthy GVS, 3rd edition. Text Book of Community Medicine, Jaypee Brothers, New Delhi, 2002 5. Epidemiology of eye diseases: Johnson and Gordon

Introduction to LASER Technology

Subject Name	Code	Type of Course	T+P+Pj	Credits
Introduction to LASER Technology		Theory + Project	1+0+2	3

Description

The basic aim of this Course is to make students appreciate the fundamentals of lasers and their diversified applications. The approach will stress more on the concepts & fundamentals with very simple or sometimes no mathematical equations.

Course Outcome

The outcome of this Course will prepare the students/trainees to use this knowledge for applications of lasers in specific fields of their interest.

Module: I

1. **Overview of Lasers:** History, Types and Applications of Lasers; 2**. Nature of Light:** Corpuscular Theory, Wave Theory, Electromagnetic Spectrum, Quantum nature of light, Dual nature of nature, De Broglie's hypothesis, wavelength associated with particle, momentum of photon, Energy-mass relation, Momentum of photon. Mass of photon.

Module: II

1. **Principle of Laser action:** Population inversion, metastable states, gain medium, Pumping mechanisms, feedback mechanism, threshold condition for laser beam generation. 2. **Types of Lasers:** Three- level and Four-level Lasers, Solid, Liquid and Gas Lasers. Brief description of Ruby, He-Ne, Nd: YAG, Excimer Laser, Carbon Dioxide Lasers, Semiconductor Lasers. X-Ray Lasers, Free-electron Lasers. Fiber Lasers.

Module: III

1. **Characteristics of LASER:** Monochromaticity, Spatial & temporal coherence, temporal coherence & monochromaticity relation, connection between spatial coherence and directionality, rightness,

Focusability, ultra-short pulse generation. Peak Power, Average Power, Duty Cycle in Pulsed Lasers.
2. **Applications of LASER:** General Applications of Lasers including Industry, Defence, Medicine, Entertainment etc.

Project:

1. Recent application of LASER technology

2. Different types of LASER used in industry focusing majorly on ophthalmic practice.

Text Book:

1. Laser Principles, Types & Applications: K R Nambiar, New Age International, 2004.

2. Lasers: Theory and Applications: A K Ghatak and K Thyagarajan, McMillan, 2003.

Research Methodology

Subject Name	Code	Type of Course	T+P+Pj	Credits
Research Methodology	CUTM1721	Theory + Project	2+0+1	3

Description

- To equip students with a basic understanding of the underlying principles of quantitative and qualitative research methods.
- Provide students with in-depth training on the conduct and management of research from inception to completion using a wide range of techniques.

Course Outcome

- Students can understand the ethical and philosophical issues associated with research in education
- This study provides knowledge on various modes of presenting and disseminating research findings.
- Enable students to acquire expertise in the use and application of the methods of data collection and analysis.
- Provide learning opportunities to critically evaluate research methodology and findings.
- Enable students to be reflexive about their role and others' roles as researchers.

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Process: Proposal Development: Basic steps involved in the health research proposal development process Literature Review: Importance and Sources, Strategies for gaining access to information, Library search, Computer search.
Research Designs: Research Title and Objectives Criteria for selecting a research title, Formulation of research objectives, Types of research objectives, Qualities of research objective

Module: II

Data Collection: Secondary Data, Primary Data, and Methods of Collection. Scaling Techniques: Concept, Types, Rating scales & Ranking Scales, Scale Construction Techniques and Multi-Dimensional Scaling. Sampling Designs: Concepts, Types and Techniques and Sample size Decision.

Module- III

Research Hypothesis: Definition, Qualities of research hypothesis Importance and types of research hypothesis. Theory of Estimation and Testing of Hypothesis Small & Large Sample Tests, Tests of Significance based on t, F, Z test and Chi-Square Test. Designing Questionnaire. Interviewing. Tabulation, Coding, Editing. Interpretation and Report Writing**.**

Textbook:

1. Research Methodology by C.R. Kothari (3rd Ed)
2. Research Methodology In the Medical & Biological Sciences by Petter Laake et al.
3. Essentials of Research Design and Methodology by Geoffrey Marczyk et al.
4. WHO, Health Research Methodology: A guide for training in research Methods, 2nd Edition, WHO- WIPRO
5. A Student's Guide to Methodology by Clough P and Nutbrown C. Sage Publication.
6. National Ethical Guidelines for Health Research in Nepal, Available at Nepal Health Research Council.
7. Field Trials of Health Interventions in Developing Countries by Smith PG, Morrow.

Business and Clinical aspects in Optometry

Subject Name	Code	Type of Course	T+P+Pj	Credits
Business and Clinical aspects in Optometry		Theory + Project	2+0+1	3

Description

Business and Clinical aspects in Optometry deals with the business aspect of optometrical practice.

Course Outcome

After the end of the course the students will be able understand the basic business models and also gather the knowledge of developing their own Optometry practice set up.

MODULE: I

Training in business, marketing & management skills and understanding financial management

MODULE: II

Understanding & evaluating potential target markets.

MODULE: III

Reviewing & Optimizing products/service mix for target markets.

MODULE: IV

Business set up, product development, retail sales, marketing.

MODULE: V

Systems & procedures in human resources.

MODULE: VI

Making a business project report & maintaining accounts for an optometric or optical establishment.

Textbook:

1. Business Aspects of Optometry –John Classe, Donald Lakin, Butterworth Heinemann
2. Business Awareness for Optometry – Nizar Hirji, Butterworth Heinemann
3. Management of Eye Care Practitioner – Irving Bennett, Butterworth Heinemann
4. Management for Opticians Thomas Appler, Raymond Dennis, Eric Muth, Butterworth Heinemann. Marketing, Managing and Contact Lenses – Robert Koetting, Butterworth Heinemann

LASER in Refractive Surgery

Subject Name	Code	Type of Course	T+P+Pj	Credits
Introduction to LASER Technology		**Theory + Project**	**1+0+2**	**3**

Description

The basic aim of this Course is to make students appreciate the fundamentals of lasers used in refractive surgery along with the latest intervention of LASER application in the Ophthalmic field.

Course Outcome

The outcome of this Course will prepare the students/trainees to use this knowledge for understanding how LASER is adding in refractive surgeries and the scope of the LASER technology in dealing various corneal conditions.

MODULE: I

1. Introduction to anatomy and physiology of cornea; 2. Different degenerative changes in cornea; 3. Corneal Ectasia

MODULE: II

1.Introduction to PRK, LASIK, Epi-LASIK, LASEK and SMILE; 2. Refractive surgery work-up: Introduction to Aberometry and Pentacam.

MODULE: III

1.Complication post LASER Refractive surgery: Management plan; 2. Re-LASIK procedures

Project:

1. Writing articles on Latest invention in LASER technologies for Refractive surgery
2. Case presentation on LASIK, PRK and SMILE surgery.

Orthoptics and Vision Therapy

Subject Name	Code	Type of Course	T+P+Pj	Credits
Orthoptics and Vision Therapy		Theory + Practical	2+2+0	4

Description

The course aims at giving the detailed in-depth knowledge about the orthoptics and various vison therapy procedures through lectures and clinical exposures and case studies.

Course Outcome

After the end of the course the students will be able to:

1. Gather in depth knowledge about how the orthoptic functions of the human eye through case discussions and practical exposures.
2. Understand in detail how a vision therapy works and what are the clinical practice in it.

MODULE: I

Nonstrabismic Binocular Vision Anomalies, Convergence insufficiency, Convergence excess

MODULE: II

Fusional vergence dysfunction. Functional Ocular Motor Dysfunction Disorders of Accommodation.

MODULE: III

Esodeviations, Exodeviations

MODULE: IV

Mechanically restrictive strabismus, Paralytic strabismus,

MODULE: V

Horizontal gaze disturbances, Vertical gaze disturbances, Ocular myasthenia gravis, Amblyopia

MODULE: VI

Diagnostic techniques, Primary care diagnosis and vision therapy for non-strabismic binocular vision disorders.

Practice:

1. RAF Ruler Test: NPA, NPC
2. PBCT, Modified Krimsky Test

3. Visual Gaze Evaluation

Textbook:

Erik M. Weissberg: Essentials of clinical binocular vision

Griffin, John R. Binocular Anomalies: Diagnosis and Vision Therapy. 4th ed. Boston: Butterworth-Heinemann, 2002. Press,

Leonard J., ed. Applied Concepts in Vision Therapy with Accompanying Disk. St. Louis: Mosby, 1997

Scheiman, Mitchell and Wick, Bruce. Clinical Management of Binocular Vision. 2nd ed. Philadelphia: Lippincott, Williams & Wilkins, 2002.

VonNoorden, Gunter K. Binocular Vision and Ocular Motility: Theory and Management Of Strabismus. 6th ed. St. Louis: Mosby, 2001.

Advanced contact lens practice -I

Subject Name	Code	Type of Course	T+P+Pj	Credits
Advanced contact lens practice -I		Theory + Practical	2+2+0	4

Description

Advanced contact lens practice -I deals with in depth study about basic contact lens practice in light with the latest trends in the industry.

Course Outcome

At the end of the course, the student should be able to: 1. Gather in depth knowledge about how to dispense a contact lens, 2. Deal with any challenges from contact practice, 3. Understand in depth about international standards for practicing contact lens clinic.

MODULE: I

Anatomy and Physiology of the Cornea and related Structures, Tears and contact lenses.

MODULE: II

Latest trends in contact lens materials & manufacturing methods, Optics of contact lens & design.

MODULE: III

Microbiology, Lens Care and Maintenance, Lens care regimen, Clinical Instrumentation in contact lens practice.

MODULE: IV

Rigid Gas Permeable corneal lens fitting, Soft contact lens fitting, Toric Contact lens fitting.

MODULE: V

Contact lens standards, Lens verification and modification: Soft and Rigid, Contact lens complications.

MODULE: VI

Special types of Contact lenses – diagnosis, surgery, protective, therapeutic, sports, partially sighted, Practice management in contact lens, Researches in contact lens

Practice:

1. Specialty CL fitting: Prosthetic, Scleral

2. Handling Lens care regimen

3. Dispensing final CL Rx.

Textbook:

1. IACLE Modules- 1- 10 2. Contact Lens Practice- Nathan Efron. Elsevier Sciences. Third Edition 3. Contact Lenses- Philips Stone 4. Fitting guide for Rigid & soft contact lens: A practical Approach: Slatt & Stein

LASER in Anterior segment disorders & Glaucoma

Subject Name	Code	Type of Course	T+P+Pj	Credits

LASER in Anterior segment disorders & Glaucoma		**Theory + Project**	**1+0+3**	**4**

Description

The basic aim of this Course is to make students appreciate the fundamentals of lasers used in anterior segment disorders along with the latest intervention of LASER application in the Ophthalmic field.

Course Outcome

The outcome of this Course will prepare the students/trainees to use this knowledge for understanding how LASER is adding in cataract surgeries and the scope of the LASER technology in dealing various anterior segment conditions.

MODULE: I

1. Idea about anatomy and physiology of crystalline lens; 2. Basic idea about crystalline lens pathology: Cataractogenesis, Lens Ectopia, congenital lens anomaly.

MODULE: II

1. Latest LASER technology used in cataract surgery: LenSx, Femtosecond LASER.

Project:

Case presentation on LenSx application in cataract surgery.

MODULE: III

1. LASER treatment in post-cataract complications: Nd: YAG LASER capsulotomy.

Project:

Case presentation on YAG Laser Capsulotomy in post-cataract management.

MODULE: IV

1. Lasers in Glaucoma: Iridotomy, Trabeculoplasty, Cyclodestruction

Project:

Case presentation on LASER treatment of Glaucoma

Text Book:

1. Laser Surgery of the Eye. The Art of Lasers in Ophthalmology- Boyd S
2. https://openophthalmologyjournal.com/VOLUME/10/PAGE/56/FULLTEXT/

Pediatric Optometry and binocular Vision I

Subject Name	Code	Type of Course	T+P+Pj	Credits
Pediatric Optometry and binocular Vision I		Theory + Practical	2+1+0	3

Description

In-depth knowledge about paediatric care and binocular vision functions in optometrical practice.

Course Outcome

After the completion of the course the students will:
1. Understand how to deal with paediatric patients as a part of specialization.
2. Have a robust idea about how binocular vision functions in humans in details.

Module: I

PAEDIATRIC Eye & Vision Examination -Assessment of paediatric vision refractive status, binocular vision & ocular motility.

Module: II

Clinical evaluation of efficient visual function, strabismus & amblyopia. Assessment & management of special needs patients including those with genetic conditions, developmental disabilities & traumatic brain injury.

Module: III

Diagnosis of paediatric eye movement disorders: Compensatory treatment & remedial therapy for refractive errors & all types of strabismus. Amblyopia & its implication on learning process. Clinical practice in Amblyopia Dyslexia & learning disabilities. Relation between learning & vision. Treatment & management of learning disabilities in children.

Module: IV

Paediatric ocular disease, Dispensing for the child patient, Pediatric Contact lens practice.

Module: V

Nonstrabismic Binocular Vision Anomalies, Convergence insufficiency, Convergence excess, Fusional vergence dysfunction. Functional Ocular Motor Dysfunction Disorders of accommodation.

Module: VI

Esodeviations, Exodeviations, Mechanically restrictive strabismus, Paralytic strabismus, Horizontal gaze disturbances, Vertical gaze disturbances, Ocular myasthenia gravis, Diagnostic techniques.

Practice:

1. Paediatric Dispensing: Glasses and CL
2. Performing Accommodative Tests.

Text Books:

1. Clinical management of binocular vision Mitchell Scheimann and Bruce Wick. 4th Edition. Lipincott Wiliams & Wilkins. 2014
2. Applied concepts in vision therapy: Leonard Press
3. Pediatric optometry: Harvey Gilmartin Butterworth-Heinemann; 1 edition.2004
4. Pickwells Binocular Vision Anomalies- Bruce JW Evans. 5th Edition
5. Binocular Vision & Ocular Motility- Gunter V. K. Noorden- Sixth Edition Mosby Publication.

Recent Advancement in Optometry

Subject Name	Code	Type of Course	T+P+Pj	Credits

Recent Advancement in Optometry		Theory+Project	2+0+1	3

Description

This course aims to build the research mindset in students and equip them with idea about journal publication houses.

Course Outcome

After the end of the course the students will:
1. Have a thorough idea about various research projects and scope of research in the field of optometry.
2. Have a knowledge about various international journals vested for the research in optometry.

In this course latest articles published in optometry and vision science journals will be discussed. This will enable the students to keep abreast of latest developments in the field of optometry and vision science. Evidence based optometry

- Research protocol – I Aim and literature review.

Suggested Reading:

Literature review of National and International optometry Journals.

LASER in Posterior segment disorders

Subject Name	Code	Type of Course	T+P+Pj	Credits
LASER in Posterior segment disorders		**Theory + Project**	**1+0+2**	**3**

Description

The basic aim of this Course is to make students appreciate the fundamentals of lasers used in anterior segment disorders along with the latest intervention of LASER application in the Ophthalmic field.

Course Outcome

The outcome of this Course will prepare the students/trainees to use this knowledge for understanding how LASER is adding in cataract surgeries and the scope of the LASER technology in dealing various anterior segment conditions.

MODULE: I

1. Basics of the anatomy and physiology of vitreous and retina

Project:

Case presentation on PRP in retinal pathology

MODULE: II

1. Lasers in Posterior segment: Reattaching of retina, Measuring retinal blood flow, Photocoagulation

Project:

Use of Focal and Grid LASER technique: A case-based approach; Highlighting the complications arising from LASER treatment in Retina: Case presentation

Text Book:

1. Laser Surgery of the Eye. The Art of Lasers in Ophthalmology- Boyd S

Pediatric Optometry and Binocular Vision II

Subject Name	Code	Type of Course	T+P+Pj	Credits
Pediatric Optometry and Binocular Vision II		Theory + Practical	2+1+0	3

Description

In-depth knowledge about paediatric care and binocular vision functions in optometrical practice.

Course Outcome

After the completion of the course the students will:
1. Understand how to deal with paediatric patients as a part of specialization.
2. Have a robust idea about how binocular vision functions in humans in details.

Module: I

Vision therapy- introduction & general concepts, latest techniques & office & home therapies, Training with VT Instruments, Practice management issues in vision therapy, non-strabismic binocular vision anomalies Instrumentation used in vision therapy.

Module: II

Computer vision syndrome (CVS) Diagnosis and Management, Perception and perceptual anomalies, Visual information processing disorders and therapy.

Module: III

Neuro optometric rehabilitation, Post trauma vision syndrome and therapy, Visual midline shift syndrome and therapy.

Module: IV

Learning disorders and therapy, Special clinical conditions, Acquired brain injury and therapy.

Module: V

Developmental disabilities Therapy, Motor disabilities therapy, Behavioral disorders and therapy.

Practice:

1. Amblyopia Therapy in infants
2. Performing cycloplegic retinoscopy
3. Vision therapy procedures: Brock string Test, Pencil Push-up Test

Text Books:

1. Clinical management of binocular vision Mitchell Scheimann and Bruce Wick. 4th Edition. Lipincott Wiliams & Wilkins. 2014

2. Applied concepts in vision therapy: Leonard Press. OEPF

3. Pediatric optometry: Harvey Gilmartin Butterworth-Heinemann; 1st edition.2004

4. Pickwells Binocular Vision Anomalies- Bruce JW Evans. 5th Edition

Advance contact lens practice II

Subject Name	Code	Type of Course	T+P+Pj	Credits
Advance contact lens practice II		Theory + Practical	2+2+0	4

Description

Advanced contact lens practice -I deals with in depth study about basic contact lens practice in light with the latest trends in the industry.

Course Outcome

At the end of the course, the student should be able to: 1. Gather in depth knowledge about how to dispense a contact lens, 2. Deal with any challenges from contact practice, 3. Understand in depth about international standards for practicing contact lens clinic.

Module: I

Extended and Continuous wear Lenses, Scleral Contact lenses.

Module: II

Bifocal and Multifocal contact lenses, Orthokeratology

Module: III

Keratoconus, Post keratoplasty contact lens fitting, Post refractive surgery contact lens fitting

Module: IV

Pediatric contact lens fitting, Cosmetic and prosthetic contact lens fitting, Contact lens for abnormal ocular conditions

Module: V

Contact lens and Myopia control, Legal issues and contact lenses, Ocular Prosthesis

Practice:
1. TBUT, Tear meniscus height measurement
2. Schirmer I and II Test.
3. Insertion and Removal techniques of CL: RGP, Soft CL, Scleral, Prosthetic CL
4. The modules can be taught in a practical + Theory mixed approach

Text Books:

1. IACLE Modules- 1- 10

2. Contact Lens Practice- Nathan Efron. Elsevier Sciences. Third Edition

3.Contact Lenses- Philips Stone

4.Fitting guide for Rigid & soft contact lens: A practical Approach: Slatt & Stein

Ocular diseases & Therapeutics

Subject Name	Code	Type of Course	T+P+Pj	Credits
Ocular diseases & Therapeutics		Theory + Project	2+0+1	3

Description

This subject deals with providing the in-depth knowledge on various ocular diseases, their detailed clinical outcome and management strategies along with understanding of the various pharmacological agents along with their indications and interactions in the field of ophthalmological science.

Course Outcome

At the end of the course the students will be able to:
1. Understand how a disease develops and how to diagnose the disease within the purview of one's filed.
2. Understand the general and ocular pharmacology in details.

Module: I

Basic principle of pharmacokinetics & Pharmacodynamics, commonly used ocular drugs, mechanism, indications, contraindications, drug dosage.

Module: II

Diagnosis, management & therapy of anterior ocular surface disease (infection & inflammation of the conjunctiva, cornea, eyelids, ocular adnexa), Inflammatory disease of the uvea, lacrimal system, glaucoma

Module: III

Posterior segment - Congenital & acquired retinal disease, diabetic retinopathy, age related maculopathy, Ocular injuries, trauma, Neuro- ophthalmic disorders

Module: IV

Co-management of systemic and ocular disease, General Pharmacology Basic principles of pharmacology. Mechanisms of action and side effects of: anti-inflammatory, autonomic,

cardiovascular, autocoid, respiratory, CNS, anti-diabetic, chemotherapeutic, immune system, and GI drugs.

Module: V

Principles and application of ocular pharmacology -Medications used in treatment of ocular disease. Ocular effects of systemic medications. Classification of ophthalmic drugs (parasympathomimetic, parasympatholytic, sympathomimetics, sympatholytic, Antibiotics, anti-inflammatory).

Module: VI

Mode of administration, Management of (Allergic Eye Disease, Lid Margin Disease, Dry eyes, corneal injuries), Case Studies, Medical Management of Glaucoma, Contraindications and adverse effects, Role of Pharmacology in clinical optometry, Diagnostic drugs in optometry, newer trends in ophthalmic drugs

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Project:

1. Drug abuse history in Ophthalmic practice
2. Nanoparticles used as binding agent for drug delivery in Ophthalmic practice
3. Drug resistance and proliferation of associated risk factors: Fluoroquinolones

Text Books:

1. Ocular Disease: Clinical Ophthalmology: Jack J Kanski
2. Ophthalmology- Yanoff & Duker. Elsevier Saunders, 2014
3. T J Zimmerman, K S Kooner : Text Book of Ocular Pharmacology, Lippincott-Raven, 1997
4. K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004
5. Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996
6. Advanced ophthalmic diagnostic & Therapeautics – 1992 , Susan C.Benes, Jaypee publishers

Neuro Optometry

Subject Name	Code	Type of Course	T+P+Pj	Credits
Neuro Optometry		Theory + Practical	2+1+0	3

Description

This course provides understanding of the issues of visual functioning which will also be related to clinical assessment issues.

Course Outcome

The objective of this course is to:
1. Equip the students with a thorough knowledge of the neurological functioning of the eyes.
And, 2. To clinically correlate with the findings.

MODULE: I

Pupils and Brainstem motility.

MODULE: II

CN II, III, IV, V, VI disorders.

MODULE: III

Papilledema, AAION and NAION.

MODULE: IV

Migraine, Optic neuritis and Neuro imaging

MODULE: IV

Nystagmus and Myasthenia

Practice:

1. Pupillary examination: RAPD evaluation

2. Fundus photography: Optic disc and pan retina evaluation

3. Ocular motility testing

4. OKN Drum test

Textbook:

1. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 8 th edition, Butterworth – Heinemann.

2. Stephen J. Miller: Parsons Diseases of the Eye, 18 th edition, Churchill Livingstone.

Specialty Clinic

Subject Name	Code	Type of Course	T+P+Pj	Credits
Specialty Clinic		Practical	0+10+0	10

Practice:

1. Clinical postings in Community Diagnostic Centre/hospitals/clinical set-up (for a maximum period of 2 months in the entire 4th semester) to get hands-on experience of special diagnostic clinics and also for carry forwarding the dissertation project under the guidance of senior Optometrist/Ophthalmologist and taking part in community outreach camps

2. Handling special instruments: OCT, A-scan, B-scan

Dissertation

Subject Name	Code	Type of Course	T+P+Pj	Credits
Dissertation		Project	0+0+12	12

Team of students will be doing a research project under the guidance of a supervisor (who could be optometrists/ ophthalmologist). Student will get the experience of doing a research in systematic approach – identifying the primary question, literature search, identifying the gaps in the literature, identifying the research question, writing up the research proposal, data collection, data analysis, thesis writing and presentation.