

Bachelor of Science Optometry



Bachelor of Science – Optometry

MISSION STATEMENT

The mission of the SRU Bachelor of Medical Sciences – Optometry is to prepare the graduate for beginning clinical practice as an optometrist in a range of urban, rural and remoting setting; to be a well-informed health professional; and to acquire critical skills in appraising scientific and clinical information.

PROGRAM LEARNING OBJECTIVES

- 1. Students will be able to use their fundamental knowledge and clinical competence in vision care as well as and when required to achieve professional excellence.
- 2. Students will demonstrate strong and well defined clinical/practical skills relevant to optometry or Vision Science.
- 3. Students will be able to practice the professional with highly professional and ethical attitude, strong communication skills, and effective professional skills to work in an inter-disciplinary team.
- 4. Students will be able to use interpersonal and collaborative skills to identify, assess and formulate problems and execute the solutions for all the common vision related problems.
- 5. Student will be able imbibe the culture of research, innovation, entrepreneurship and incubation.
- 6. Students will be able to participate in lifelong learning process for a highly productive career and will be able to relate the concept of vision science towards serving the cause of the society.

PROGRAM LEARNING OUTCOMES

On completion of the coursed you will be able to:

- 1. Demonstrate a thorough understanding of the fundamental science underpinning the fields of medical science and your science discipline and have a range of transferrable professional skills.
- 2. Demonstrate a thorough understanding of the factors that influence sight and the visual system.
- 3. Undertake basic medical research utilizing special skills and knowledge in at least one major area of science.

- 4. Contribute to developing and/or evaluating new treatments and strategies for health problems by employing specific skills in a major area of science and appreciate the cross-disciplinary nature of the medical sciences and work, as appropriate, with other health professionals.
- 5. Select and perform common diagnostic and therapeutic optometric procedure.
- 6. Identify and treat eye dysfunction and diseases within the scope of optometric therapeutic practice.
- 7. Communicate clearly and effectively with patients and other health professionals.

ENTRY REQUIREMENTS

The student must have 6 OPTses is SGCE/GCE/IGCSE O'Level including a OPTs with Grade C or better in English Language and at least four other subjects. Special: Mathematics and any other two from Biology, Chemistry, Combined Science, Physics, Physical Science and or Human and Social Biology. Faculty may set mature entry requirements subject to approval by the Senate.

CAREER OPPORTUNITIES

- Eye Doctor
- Optometrist
- Optician
- Sales Executive
- Teacher etc.

Teaching Methods

At Springfield Research University (SRU), we are committed to employing a diverse array of teaching methods to ensure a comprehensive and engaging learning experience for our students. Our teaching methods are carefully selected to align with the programme's objectives and to meet the needs of our diverse student body. The following are the key teaching methods utilized across all SRU programmes:

1. Lectures:

 Lectures are used to introduce and explain key concepts, theories, and principles. They provide a structured and systematic approach to delivering content, allowing students to gain a solid foundation in their respective fields. Lectures are often supplemented with visual aids, multimedia presentations, and interactive elements to enhance understanding and engagement.

2. Seminars:

• Seminars are interactive sessions that promote critical thinking and in-depth discussion on specific topics. Students are encouraged to actively participate, share their perspectives, and engage in debates. Seminars provide an opportunity for students to develop their analytical and communication skills.

3. Workshops:

• Workshops are hands-on sessions that focus on practical skills and applications. These sessions allow students to engage in experiential learning, apply theoretical knowledge to real-world scenarios, and collaborate with peers on projects and activities. Workshops are designed to foster creativity, problem-solving, and teamwork.

4. Problem-Based Learning (PBL):

• Problem-Based Learning is a student-centered approach that involves presenting students with complex, real-world problems to solve. Students work in small groups to research, discuss, and propose solutions, developing critical thinking and collaborative skills in the process. PBL encourages independent learning and active engagement.

5. Case Studies:

 Case studies are used to analyze real-life situations and decision-making processes. Students examine and discuss case studies to understand the context, identify key issues, and evaluate possible solutions. This method helps students develop their analytical and problem-solving abilities while relating theoretical concepts to practical situations.

6. Clinical Practice:

• For programmes that include a clinical component, such as Health and Medical Sciences, clinical practice is an integral part of the curriculum. Students gain handson experience in clinical settings, working under the supervision of qualified professionals. This method provides valuable opportunities for students to apply their knowledge, develop clinical skills, and gain insights into professional practice.

7. Research Projects:

• Research projects are designed to cultivate a culture of inquiry and innovation. Students engage in independent or group research projects, exploring topics of interest and contributing to the body of knowledge in their field. Research projects develop students' research skills, critical thinking, and ability to communicate findings effectively.

8. Online Learning:

• Online learning is incorporated to provide flexible and accessible education. SRU utilizes online platforms to deliver lectures, conduct discussions, and facilitate collaborative projects. Online learning allows students to access course materials, participate in virtual classrooms, and engage with peers and instructors remotely.

9. Continuous Assessment:

 Continuous assessment methods, such as quizzes, assignments, and presentations, are used to monitor students' progress and provide ongoing feedback. These assessments help identify areas for improvement and ensure that students are meeting learning objectives throughout the course.

10. Peer Learning:

• Peer learning encourages students to collaborate and learn from each other. Group projects, study groups, and peer review sessions provide opportunities for students to share knowledge, offer feedback, and support each other's learning journey.

At SRU, our commitment to employing diverse and effective teaching methods ensures that our students receive a well-rounded education that prepares them for success in their chosen fields. We continuously review and enhance our teaching practices to provide the best possible learning experience for our students.

Delivery Methods

At Springfield Research University (SRU), we utilize a variety of delivery methods to ensure that our educational programmes are accessible, engaging, and effective. Our delivery methods are designed to cater to the diverse needs of our students and to provide flexible learning opportunities. The following are the key delivery methods employed across all SRU programmes:

1. In-Person Delivery:

- **Classroom Lectures:** Traditional classroom lectures provide a structured and interactive environment where students can engage with instructors and peers. These sessions often include discussions, presentations, and multimedia resources to enhance learning.
- Laboratory Sessions: For programmes that require practical and experimental learning, laboratory sessions are conducted in specialized labs equipped with the necessary tools and equipment. These hands-on sessions allow students to apply theoretical knowledge in a controlled environment.
- **Clinical Placements:** Health and Medical Sciences programmes include clinical placements in hospitals, clinics, and healthcare facilities. These placements provide students with real-world experience under the supervision of qualified professionals.

2. Online Delivery:

- Virtual Classrooms: Online platforms are used to deliver lectures, conduct discussions, and facilitate collaborative projects. Virtual classrooms enable students to access course materials, participate in live sessions, and engage with peers and instructors from remote locations.
- **Recorded Lectures:** Recorded lectures are made available for students to access at their convenience. This flexible approach allows students to review and revisit course content as needed.
- **Online Assessments:** Online assessments, including quizzes, assignments, and exams, are conducted through secure online platforms. These assessments provide timely feedback and help monitor students' progress.

3. Blended Learning:

- **Hybrid Courses:** Blended learning combines in-person and online delivery methods to provide a flexible and comprehensive learning experience. Hybrid courses may involve alternating between classroom sessions and online activities.
- Flipped Classroom: In the flipped classroom model, students access instructional content online before class and use in-person sessions for interactive, application-based activities. This approach encourages active learning and deeper engagement with the material.

4. Independent Study:

- **Self-Paced Learning:** Self-paced learning allows students to progress through course materials at their own speed. This method is ideal for students who prefer to learn independently and manage their own schedules.
- **Research Projects:** Independent research projects provide students with the opportunity to explore topics of interest, develop research skills, and contribute to the body of knowledge in their field. Faculty advisors provide guidance and support throughout the research process.

5. Collaborative Learning:

- **Group Projects:** Group projects foster teamwork and collaboration among students. These projects often involve problem-solving, research, and presentations, allowing students to learn from each other and develop interpersonal skills.
- **Peer Review:** Peer review sessions encourage students to provide and receive constructive feedback on each other's work. This method promotes critical thinking, reflection, and improvement.

6. Experiential Learning:

- Internships and Work Placements: Internships and work placements provide students with practical experience in their chosen field. These opportunities allow students to apply their knowledge in real-world settings, develop professional skills, and build industry connections.
- Field Trips and Excursions: Field trips and excursions offer experiential learning opportunities outside the classroom. These activities provide students with firsthand exposure to relevant sites, industries, and practices.

7. Continuous Assessment:

- Formative Assessments: Formative assessments, such as quizzes, assignments, and in-class activities, provide ongoing feedback to students and help track their progress. These assessments are designed to support learning and identify areas for improvement.
- **Summative Assessments:** Summative assessments, including final exams, projects, and presentations, evaluate students' overall performance and mastery of course content.

At SRU, our diverse delivery methods ensure that students receive a well-rounded and flexible education that caters to their individual learning preferences. We are committed to continuously enhancing our delivery methods to provide the best possible learning experience for our students.

COURSE STRUCTURE

Year 1: Semester I

Code	Course	Lectures	Practical	Credits
OPT100	Human Anatomy and Physiology	120	0	12
BPT101	Skills for Medical Scientists I	60	60	12
OPT102	Nutrition	120	0	12
BPT103	Physics for Health Science	120	0	12
OPT104	Introduction to Health Care and First Aid	120	0	12
BPT105	Molecular Basis of Life	120	0	12
OPT106	Human Anatomy and Physiology Practical	0	120	12
OPT107	Introduction to Health Care and First Aid	0	120	12
	Practical			
	Total			96

Year 1: Semester 2

Code	Course	Lectures	Practical	Credits
OPT108	Human Anatomy and Physiology II	120	0	12
OPT109	Biochemistry	120	0	12
OPT110	Pharmacology	120	0	12
BPT111	Chemistry for Life Sciences	120	0	12
BPT112	Communication for Academic Purposes	120	0	12
OPT113	Human Anatomy and Physiology – II	0	120	12
	Practical			
OPT114	Biochemistry Practical	0	120	12
OPT115	Pharmacology Practical	0	120	12
	Total			96

Year 2: Semester 3

Code	Course	Lectures	Practical	Credits
OPT116	Ocular Anatomy and Physiology	120	0	12
OPT117	Ocular Pharmacology, Microbiology and	120	0	12
	Clinical Pathology			
OPT118	Physiological Optics and Principle of	120	0	12
	Refraction			
OPT119	Ophthalmic Instruments	120	0	12
BPT104	Communication for Professional Purposes	120	0	12

OPT120	Ocular Anatomy and Physiology Practical	0	120	12
OPT121	Ocular Pharmacology, Microbiology and	0	120	12
	Clinical Pathology Practical			
OPT122	Physiological Optics and Principle of	0	120	12
	Refraction Practical			
OPT123	Ophthalmic Instruments Practical	120	0	12
	Total			108

Year 2: Semester 4

Code	Course	Lectures	Practical	Credits
OPT124	Clinical ophthalmology	120	0	12
OPT125	Clinical Refraction and Binocular Vision	120	0	12
OPT126	Low Vision and Optical Dispensing	120	0	12
OPT127	Community Ophthalmology and Eye Bank	120	0	12
OPT128	Human Immunology and Infections and	120	0	12
	Diseases			
OPT129	Clinical Ophthalmology Practical	0	120	12
OPT130	Clinical Refraction and Binocular Vision	0	120	12
	Practical			
OPT131	Low Vision and Optical Dispensing Practical	0	120	12
	Total			96

Year 3: Semester 5

Code	Course	Lectures	Practical	Credits
OPT132	Knowledge of Health and Illness for	60	60	12
	Optometrists I			
OPT133	Legal and Ethical Aspects of Health Care	120	0	12
OPT134	Human Molecular Genetics	120	0	12
OPT135	Diseases of the Eye	120	0	12
OPT135	Clinical Skills for Optometrists I	20	100	12
	Total			60

Year 3: Semester 6

Code	Course	Lectures	Practical	Credits
OPT137	Principles of Pharmacology and Toxicology	60	60	12
OPT138	Pathophysiology for Medical Science	120	0	12
OPT139	Ocular Anatomy and Histology	120	0	12
OPT140	Knowledge of Health and Illness for Optometrist II	120	0	12
OPT141	Clinical Skills for Optometrists II	20	100	12
	Total			60

Year 4: Semester 7

Code	Course	Lectures	Practical	Credits
OPT142	Normal Eye and Vision	60	60	12
OPT143	Ocular Examination Techniques and Ocular	120	0	12
	Therapeutics			
OPT144	Systemic Ophthalmology	120	0	12
OPT145	Clinical Skills for Optometrists III	20	100	12
	Total			48

Year 4: Semester 8

Code	Course	Lectures	Practical	Credits
OPT146	Disorders for Motility	60	60	12
OPT147	Optometry Practice I	20	100	12
OPT148	Clinical Placement I	20	100	12
	Total			36

Year 5: Semester 9

Code	Course	Lectures	Practical	Credits
OPT149	Optometry Practice II	20	100	12
OPT150	Clinical Placement II	20	100	12
OPT151	Project Work I	20	100	12
	Total			36

Year 5: Semester 10

Code	Course	Lectures	Practical	Credits
OPT152	Optometry Practice III	20	100	12
OPT153	Clinical Placement III	20	100	12
OPT154	Project Work II	20	100	12
	Total			36

COURSE SYNOPSIS AND DESCRIPTIONS

Human Anatomy and Physiology

This course provides a comprehensive understanding of the structure and function of the human body, with a specific focus on the visual system. Students will explore anatomical structures, physiological processes, and their relevance to optometry practice. Topics include ocular anatomy, visual pathways, and the impact of systemic health on eye function. Practical applications for optometric assessment and patient care will be emphasized.

Introduction to Healthcare and First Aid

This course provides foundational knowledge in healthcare practices and first aid specifically tailored for optometry students. Participants will learn essential skills related to patient care, emergency response, and basic medical procedures. Topics include patient communication, infection control, wound management, and cardiopulmonary resuscitation (CPR). The course aims to equip future optometrists with the necessary competencies to handle healthcare situations effectively and ethically.

Skills for Medical Scientists I

The Skills for Medical Scientists I course equips optometry students with essential practical skills for scientific research and clinical practice. Participants will learn laboratory techniques, data analysis, and effective communication. Topics include experimental design, statistical methods, and scientific writing. This course prepares students for evidence-based optometric practice and research endeavors.

Nutrition

The Nutrition course provides optometry students with essential knowledge about balanced diets, menu planning, and the role of macro and micro minerals associated with eye health. Students will learn how nutrition impacts ocular health and gain insights into dietary considerations for maintaining optimal vision.

Physics for Health Science

The Physics for Health Science course provides optometry students with a foundational understanding of physics principles relevant to eye health. Participants will study topics such as light, optics, refraction, and visual perception. The course aims to equip future optometrists with the knowledge necessary to address optical challenges and apply physics concepts in clinical practice.

Molecular Basis of Life

The Molecular Basis of Life course provides optometry students with foundational knowledge about the biological molecules and cellular processes that underpin life. Participants will study topics such as DNA, RNA, protein synthesis, metabolism, and cell signaling. Understanding these molecular mechanisms is essential for comprehending ocular health and disease at the cellular level.

Human Anatomy and Physiology I Practical

The Human Anatomy and Physiology Practical course provides optometry students with hands-on experience in understanding the structure and function of the human body. Through cadaveric dissection and exploration of human biology, students gain practical skills related to health and disease. Topics cover major body systems, regions, and ethical considerations. This course enhances critical thinking, communication, and lab proficiency.

Human Anatomy and Physiology II

The Human Anatomy and Physiology II course delves into the intricate workings of the human body, focusing on vital components responsible for gas exchange, energy consumption, and overall health. Topics covered include the respiratory and digestive systems, providing optometry students with essential knowledge relevant to ocular health and systemic function.

Biochemistry

The Biochemistry course provides optometry students with foundational knowledge about the chemical processes occurring within living organisms. Participants will study topics such as biomolecules (proteins, nucleic acids, lipids), enzymatic reactions, metabolism, and cellular signaling pathways. Understanding biochemistry is crucial for comprehending ocular health, drug interactions, and systemic influences on vision.

Pharmacology

The Pharmacology course provides optometry students with essential knowledge about drugs and medications relevant to eye health. Participants will study topics such as drug interactions, ocular pharmacokinetics, and therapeutic agents used in optometric practice. Understanding pharmacology is crucial for making informed clinical decisions and ensuring patient safety.

Chemistry for Life Sciences

The Chemistry for Life Sciences course provides optometry students with foundational knowledge about the chemical processes occurring within living organisms. Participants will study topics such as biomolecules (proteins, nucleic acids, lipids), enzymatic reactions, metabolism, and cellular signaling pathways. Understanding biochemistry is crucial for comprehending ocular health, drug interactions, and systemic influences on vision.

Communication for Academic Purposes

The Communication for Academic Purposes course equips optometry students with essential language skills for effective communication in academic and professional contexts. Participants will learn to write clear and concise reports, engage in scientific discussions, and present research findings. The course aims to enhance students' ability to communicate confidently and accurately within the optometry field.

Human Anatomy and Physiology II Practical

The Human Anatomy and Physiology II Practical course provides optometry students with hands-on experience in understanding the structure and function of the human body. Through cadaveric dissection and exploration of human biology, students gain practical skills related to health and disease. Topics cover major body systems, regions, and ethical considerations. This course enhances critical thinking, communication, and lab proficiency.

Biochemistry Practical

The **Biochemistry Practical** component of the Bachelor of Science in Optometry equips students with essential laboratory skills and knowledge related to biochemistry. During this course, students engage in hands-on activities to explore various aspects of biochemistry relevant to eye health. Topics covered include qualitative analysis of carbohydrates (such as glucose, fructose, lactose, maltose, sucrose, and starch), identification tests for proteins (albumin and casein), and quantitative analysis of reducing sugars (using the DNSA method) and proteins (using the Biuret method). These practical skills are crucial for optometrists, enabling them to accurately diagnose and manage ocular conditions and contribute to optimal patient outcomes.

Pharmacology Practical

The **Pharmacology Practical** component equips optometry students with essential knowledge and practical skills related to pharmacology and therapeutics. Through hands-on activities and theoretical learning, students explore drug interactions, mechanisms of action, and clinical applications relevant to eye health. These acquired skills are crucial for optometrists, enabling them to make informed decisions in patient care and contribute to optimal visual outcomes.

Ocular Human Anatomy and Physiology

This foundational course provides optometry students with essential knowledge of the anatomy and physiology of the visual system. Students explore the structure and purpose of major body systems relevant to ophthalmology, from the anterior eye to the brain. Topics covered include ocular haemodynamics, genetics, pathology, microbiology, and common eye pathologies. Additionally, students gain insights into the embryonic development of the visual

system. The course equips future optometrists with a solid understanding of how the eye functions and its clinical implications.

Ocular Pharmacology, Microbiology, and Clinical Pathology

This comprehensive course delves into the intricate world of ocular health. You'll explore three critical areas: Ocular Pharmacology: Understand the mechanisms of ocular drugs, their effects, and therapeutic applications. Dive into topics like drug interactions, side effects, and evidence-based prescribing. Microbiology: Explore ocular infections caused by bacteria, viruses, and fungi. Learn diagnostic techniques, treatment protocols, and infection control measures. Clinical Pathology: Investigate ocular diseases through laboratory analysis. Study ocular tissues, fluids, and cellular components. Gain insights into disease markers and their significance. By mastering these domains, you'll be well-prepared to contribute to eye health and patient care.

Physiological Optics and Principle of Retraction

This course delves into the fascinating world of vision and light. Students explore the physiological aspects of vision, including how the eye processes light, accommodates, and perceives visual stimuli. Topics cover retinal function, visual pathways, and the role of the lens in focusing light onto the retina. Additionally, students learn about the principles of refraction, understanding how lenses and optical systems correct refractive errors. Practical applications include prescribing corrective lenses and managing visual anomalies. By mastering these concepts, future optometrists enhance their ability to optimize visual health and provide precise optical solutions.

Ophthalmic Instruments

In this course, optometry students delve into the world of diagnostic tools and equipment used in eye care. They learn about various ophthalmic instruments, their functions, and applications. Topics include slit lamps, tonometers, retinoscopes, keratometers, and perimeters. Students gain hands-on experience in using these instruments for eye examinations, measurements, and assessments. Understanding ophthalmic instruments is crucial for accurate diagnosis, treatment planning, and patient care.

Communication for Professional Purposes

In this course, optometry students develop essential communication skills for effective patient interactions and collaboration with other healthcare professionals. Topics include patient-centered communication, informed consent, medical terminology, and interprofessional teamwork. Students learn to convey complex information clearly, empathetically, and ethically. Effective communication is crucial for successful optometric practice, ensuring optimal patient care and professional relationships.

Ocular Anatomy and Physiology Practical

This practical course provides optometry students with hands-on experience in understanding the intricate anatomy and physiology of the eye. Through laboratory sessions, students explore the gross anatomy of the eye, cellular components, and molecular details relevant to vision. They learn to apply this knowledge practically, using ophthalmic instruments such as slit lamps and tonometers. By mastering these skills, students enhance their ability to assess ocular health and contribute to optimal patient care.

Ocular Pharmacology, Microbiology, and Clinical Pathology Practical

In this practical course, optometry students gain hands-on experience in three critical areas: Ocular Pharmacology: Explore the mechanisms of ocular drugs, their effects, and therapeutic applications. Learn to assess drug interactions, side effects, and evidence-based prescribing. Microbiology: Dive into ocular infections caused by bacteria, viruses, and fungi. Master diagnostic techniques, treatment protocols, and infection control measures. Clinical Pathology: Investigate ocular diseases through laboratory analysis. Study ocular tissues, fluids, and cellular components. Understand disease markers and their significance. By mastering these practical skills, students enhance their ability to diagnose and manage eye conditions effectively, contributing to optimal patient care and visual health.

Physiological Optics and Principle of Refraction Practical

In this practical course, optometry students gain hands-on experience in understanding the intricate principles of physiological optics and refraction. They explore the behavior of light as it interacts with the eye, including concepts like refraction, reflection, and vergence. Through laboratory sessions, students learn to use ophthalmic instruments effectively, such as slit lamps and retinoscopes. By mastering these practical skills, they enhance their ability to assess visual function, prescribe corrective lenses, and contribute to optimal patient care.

Ophthalmic Instruments Practical

In this practical course, optometry students gain hands-on experience with a variety of ophthalmic instruments used in eye care. They learn to operate and interpret results from tools such as slit lamps, tonometers, retinoscopes, and other diagnostic equipment. Through guided practice, students develop proficiency in assessing ocular health, measuring intraocular pressure, and evaluating refractive errors. These practical skills are essential for accurate diagnosis, treatment planning, and patient care.

Clinical Ophthalmology

In this course, optometry students delve into the practical aspects of ophthalmology. They develop crucial skills in the clinical assessment, treatment, and management of eye and vision disorders. The curriculum emphasizes evidence-based and reflective practice, interprofessional collaborative approaches, and practice management. By mastering these skills, students are well-prepared to contribute effectively to eye health and patient care.

Clinical Refraction and Binocular Vision

This course focuses on two critical aspects of optometry: **Clinical Refraction**: Students learn to perform accurate refractions, determining the appropriate corrective lenses for patients. They explore techniques such as retinoscopy, subjective refraction, and prescribing spectacles or contact lenses. **Binocular Vision**: Understanding how both eyes work together is essential. Students study binocular vision assessment, including Worth's classification and clinical tests for detecting and managing binocular vision disorders.

Low Vision and Optical Dispensing

In this course, students delve into the specialized field of low vision. They learn to assess and manage visual impairments, including conditions that require customized optical solutions. Topics cover magnification devices, adaptive aids, and personalized spectacle prescriptions for low vision patients. Additionally, students gain practical skills in dispensing and fitting low vision aids. By mastering these concepts, future optometrists contribute to enhancing the quality of life for individuals with visual challenges.

Community Ophthalmology and Eye Bank

This course focuses on two critical areas: Community Ophthalmology: Students explore eye health services within the community. They learn about preventive measures, health promotion, and community-based eye care programs. Topics include vision screening, outreach clinics, and collaboration with local healthcare systems. Eye Bank: Students gain insights into eye donation, corneal transplantation, and eye bank management. They learn about tissue preservation, ethical considerations, and the role of eye banks in restoring vision for those in need. Practical skills include donor evaluation and corneal tissue processing.

Human Immunology and Infections and Diseases

This exciting and relevant course combines aspects of human physiology, immunology, and infectious diseases. Students explore the pathology, transmission, and epidemiology of infectious diseases affecting both humans and animals. The curriculum emphasizes practical laboratory skills, nurturing scientific expertise for careers in medical research and clinical settings.

Clinical Ophthalmology Practical

In this practical course, optometry students gain hands-on experience in clinical ophthalmology. They learn to apply theoretical knowledge to real-world scenarios, focusing on eye examinations, diagnostic procedures, and patient management. Topics covered include slit lamp examinations, fundoscopy, visual field testing, and tonometry. By mastering these practical skills, students enhance their ability to assess ocular health, diagnose eye conditions, and contribute effectively to patient care.

Clinical Refraction and Binocular Vision Practical

In this practical course, optometry students gain hands-on experience in clinical decisionmaking related to refraction and binocular vision. They learn to apply theoretical knowledge to real-world scenarios, focusing on eye examinations, diagnostic procedures, and patient management. Topics covered include retinoscopy, subjective refraction, cover tests, and assessment of binocular vision. By mastering these practical skills, students enhance their ability to assess ocular health, prescribe corrective lenses, and contribute effectively to patient care.

Low Vision and Optical Dispensing Practical

In this practical course, optometry students gain hands-on experience in assessing and managing visual impairments. They learn to provide specialized advice on selecting and fitting spectacles for complex cases. The curriculum emphasizes multifocal and pediatric dispensing characteristics, as well as contact lens knowledge and refractive management. By mastering

these practical skills, students contribute to enhancing the quality of life for individuals with visual challenges.

Knowledge of Health and Illness for Optometrists I

This foundational course equips optometry students with essential knowledge related to health and illness. Topics covered include anatomy and physiology of the eye, common ocular conditions, systemic diseases affecting vision, and patient communication. Students learn to recognize signs of ocular pathology, understand disease processes, and develop effective patient management strategies. Practical skills such as case history taking and basic diagnostic techniques are emphasized.

Legal and Ethical Aspects of Health Care

This course explores the legal and ethical dimensions of optometric practice. Students delve into topics such as informed consent, patient confidentiality, professional liability, and regulatory frameworks. Case studies and real-world scenarios enhance understanding of legal obligations and ethical decision-making. By the end of the course, students are equipped to navigate complex healthcare environments while upholding professional standards.

Human Molecular Genetics

This course delves into the intricate world of genetics at the molecular level. Students explore the structure and function of DNA, gene expression, inheritance patterns, and genetic variation. Topics include Mendelian genetics, chromosomal abnormalities, and the impact of genetic factors on ocular health. Practical applications, such as genetic testing and counseling, are also covered. By understanding the molecular basis of hereditary conditions, optometry students gain insights into personalized patient care.

Diseases of the Eye

This course provides a comprehensive understanding of ocular health and disease. Students delve into the intricacies of eye conditions, including common disorders such as cataracts, glaucoma, and diabetic retinopathy. Topics cover etiology, clinical manifestations, diagnostic techniques, and management strategies. Students learn to recognize ocular pathology, interpret clinical findings, and collaborate with other healthcare professionals. The course emphasizes evidence-based practice and prepares optometry students to contribute effectively to patient care.

Clinical Skills for Optometrists I

This foundational course equips optometry students with essential clinical competencies. Topics include comprehensive eye examinations, visual pathway integrity assessment, and diagnostic procedures. Students learn to diagnose vision problems, interpret findings, and develop patient management strategies. Practical skills, such as refraction techniques and case history taking, are emphasized. By mastering these clinical skills, students prepare for their future roles as optometrists.

Principles of Pharmacology and Toxicology

This course provides a foundational understanding of drug action and toxicology. Students explore drug chemistry, receptor interactions, dose-response relationships, and receptor-mediated signal transduction. Topics also cover membrane receptors, autonomic

pharmacology, and mechanisms of drug action in treating clinical conditions. By mastering these principles, optometry students gain insights into safe medication use and the impact of chemicals on health.

Pathophysiology for Medical Science

This course delves into the underlying mechanisms of disease processes. Students explore how alterations in normal physiological functions contribute to various health conditions. Topics cover cellular dysfunction, inflammation, immune responses, and organ-specific pathologies relevant to optometry. By understanding pathophysiology, optometry students gain insights into diagnosing ocular disorders and developing effective management strategies.

Ocular Anatomy and Histology

This course provides a detailed exploration of the human eye's structure and cellular composition. Students delve into ocular anatomy, including the cornea, lens, retina, and optic nerve. Additionally, histological aspects—such as tissue layers, cell types, and specialized structures—are covered. Practical knowledge gained from studying ocular anatomy and histology is essential for optometrists, enabling accurate diagnosis, patient communication, and effective eye care.

Knowledge of Health and Illness for Optometrists II

This course builds upon foundational knowledge, focusing on advanced health and illness concepts relevant to optometry. Topics include systemic diseases affecting ocular health, pharmacology, and evidence-based practice. Optometry students deepen their understanding of conditions such as diabetes, hypertension, and autoimmune disorders, considering their impact on vision. Practical skills in patient assessment and interdisciplinary collaboration are emphasized. By mastering these advanced concepts, students enhance their ability to provide comprehensive eye care.

Clinical Skills for Optometrists II

This advanced course builds upon foundational clinical competencies. Students refine their practical skills, focusing on specialized optometric procedures. Topics include advanced refraction techniques, contact lens fitting, binocular vision assessments, and ocular disease management. Emphasis is placed on evidence-based practice, patient communication, and interdisciplinary collaboration. By mastering these skills, students enhance their ability to provide comprehensive eye care and contribute effectively to patient well-being.

Normal Eye and Vision

This course provides a comprehensive understanding of the healthy human eye and visual system. Students explore ocular anatomy, physiology, and visual pathways. Topics cover refractive errors, visual acuity, color vision, and binocular vision. Practical skills in assessing visual function and interpreting findings are emphasized. By mastering the normal eye and vision, optometry students lay the foundation for diagnosing and managing ocular conditions.

Ocular Examination Techniques and Ocular Therapeutics

This course equips optometry students with essential skills in assessing ocular health and managing eye conditions. Topics include:

1. Ocular Examination Techniques:

- Learn to perform comprehensive eye examinations using various tests and procedures.
- Diagnose vision problems and impairments.
- Prescribe optical aids such as spectacles and contact lenses.
- Provide visual training and essential advice for patient well-being.

2. Ocular Therapeutics:

- Understand ocular therapeutic drugs and their applications.
- Explore the pathogenesis, clinical features, and management of anterior eye disorders.
- Develop the ability to make valid clinical judgments and recommend evidencebased treatment options.

By mastering these skills, optometry students prepare to provide comprehensive eye care and contribute effectively to patient health.

Systemic Ophthalmology

This course explores the intricate relationship between systemic health and ocular conditions. Optometry students delve into how various diseases affecting other organs impact vision and eye health. Topics include cardiovascular disorders, neurological conditions, endocrine diseases, autoimmune disorders, and geriatric considerations. By understanding these connections, students enhance their ability to provide holistic eye care within a broader healthcare context.

Clinical Skills for Optometrists III

This advanced course builds upon foundational clinical competencies, equipping optometry students with specialized skills. Students delve into advanced refraction techniques, including subjective and objective methods tailored for complex prescriptions and challenging cases. Additionally, the course covers comprehensive contact lens fitting and management, encomOPTsing various lens types (soft, rigid, specialty) and practical experience in assessing comfort and troubleshooting. Ocular disease assessment is a key focus, involving thorough evaluation of anterior and posterior eye health. Students learn to recognize ocular pathology (such as glaucoma and macular degeneration) and apply evidence-based management strategies. Interdisciplinary collaboration is emphasized, enabling effective communication with ophthalmologists, pharmacists, and other healthcare professionals. By mastering these skills, students enhance their ability to provide comprehensive eye care and contribute effectively to patient well-being.

Disorders of Motility

This course focuses on diagnosing, managing, and treating eye movement disorders and visual impairments. Optometry students gain a deep understanding of ocular misalignment (strabismus), eye movement disorders, ocular diseases, and medical microbiology. Practical experience through clinical placements enhances skills in working with patients and clinicians. Graduates can pursue diverse career paths, from government hospitals and community eye clinics to rehabilitation centers for patients with neurological conditions.

Optometry Practice I

This foundational course prepares students to become primary eyecare practitioners. Students gain expert knowledge of the eye and visual system, enabling them to diagnose visual problems and offer treatment options. These treatments may include optical lenses or visual training. The course emphasizes practical skills essential for future optometrists.

Clinical Placement I

During Clinical Placement I, optometry students gain practical experience in real-world settings. They participate in supervised clinical assessments, diagnosis, and management of eye and vision disorders. The focus is on refining clinical skills, patient interaction, and evidence-based practice. Students engage in placements across various settings, including hospitals, clinics, and regional optometry practices. This hands-on experience prepares them for their future roles as optometrists.

Optometry Practice II

In this course, students build on their foundational optometric knowledge. They delve into advanced clinical skills, patient communication, and evidence-based practice. Topics include specialized refraction techniques, contact lens fitting, and comprehensive ocular disease assessment. By mastering these skills, students prepare to provide high-quality eye care and contribute effectively to patient well-being.

Clinical Placement II

Clinical Placement II offers practical experience for Bachelor of Science in Optometry students. Under the guidance of experienced optometrists, students engage in real-world settings, applying theoretical knowledge to assess eye health, perform diagnostic tests, and develop treatment plans. The placement covers primary eye care, specialty clinics, and community outreach, equipping students with valuable skills for their future careers as optometrists.

Project Work I

Project Work I provides optometry students with an opportunity to engage in practical research and hands-on projects. Under faculty guidance, students explore topics related to vision impairment, tear production, and the evaluation of spectacles. Through this course, students develop critical thinking skills, enhance their understanding of optometry, and contribute to advancements in the field.

Optometry Practice III

Optometry Practice III builds on foundational knowledge, emphasizing clinical skills and patient interaction. Students delve into advanced optometric techniques, including diagnostic assessments, contact lens fitting, and low vision management. The course integrates theory with practical experience, preparing students to excel in primary eye care and contribute effectively to patient well-being.

Clinical Placement III

Clinical Placement III provides optometry students with an extended work-based experience, replacing the traditional pre-registration year. Under the guidance of experienced optometrists, students engage in patient-facing assessments, refine clinical skills, and collaborate within

real-world optometry settings. The placement emphasizes practical learning, preparing students for their careers as optometrists.

Project Work II

Project Work II provides optometry students with practical experience and hands-on projects. Through this course, students delve into topics related to vision impairment, chronic diseases, and other relevant areas. By engaging in research and project work, students enhance their critical thinking skills and gain firsthand experience, preparing them for their careers as optometrists.

COURSE OUTLINES

Human Anatomy and Physiology I

Course Description

This course provides an in-depth understanding of human anatomy and physiology with a focus on systems relevant to optometry. Students will explore the structure and function of the human body, including the visual system, and learn how these systems interact to maintain homeostasis. The course combines theoretical knowledge with practical applications to prepare students for clinical aspects of optometry.

Learning Objectives

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

- 1. Demonstrate comprehensive knowledge of human anatomy and physiology.
- 2. Describe the structure and function of major body systems, with an emphasis on the visual system.
- 3. Understand the physiological processes that maintain homeostasis.
- 4. Apply anatomical and physiological concepts to clinical scenarios in optometry.
- 5. Analyze the development and function of the visual system from embryonic stages to adulthood.

Topics Covered

- 1. Introduction to Human Anatomy and Physiology
 - Overview of anatomical terminology
 - Levels of organization in the human body
- 2. Cell Biology

- Cell structure and function
- Cell membrane physiology

3. Tissues and Integumentary System

- Types of tissues
- Skin structure and function

4. Skeletal System

- Bone structure and function
- Joint anatomy

5. Muscular System

- Muscle tissue types
- Mechanisms of muscle contraction

6. Nervous System

- Neuron structure and function
- Central and peripheral nervous systems

7. Endocrine System

- Hormone function and regulation
- Major endocrine glands

8. Cardiovascular System

- Heart anatomy and physiology
- Blood vessels and circulation

9. Respiratory System

- Structure and function of the respiratory tract
- Mechanisms of breathing

10. Digestive System

- Anatomy of the digestive organs
- Processes of digestion and absorption

11. Urinary System

- Kidney structure and function
- Urine formation and excretion

12. Reproductive System

- Male and female reproductive anatomy
- Reproductive physiology

13. Visual System

- Anatomy of the eye
- Visual pathways and processing

14. Development of the Visual System

- Embryonic development of the eye
- Postnatal development and aging

Assessment

- Midterm Exams: 30%
- **Final Exam**: 40%
- Lab Reports: 20%
- Class Participation: 10%

Recommended Reading

- 1. "Human Anatomy & Physiology" by Elaine N. Marieb and Katja Hoehn
- 2. "Clinical Anatomy and Physiology of the Visual System" by Lee Ann Remington
- 3. "Principles of Anatomy and Physiology" by Gerard J. Tortora and Bryan H. Derrickson
- 4. "Essentials of Anatomy and Physiology" by Valerie C. Scanlon and Tina Sanders

Skills for Medical Scientists I

Course Description

This course is designed to equip students with essential skills required for medical research and practice. It covers fundamental techniques in scientific inquiry, data analysis, and critical thinking. Emphasis is placed on developing competencies in laboratory skills, scientific communication, and ethical considerations in medical research. This foundational course prepares students for advanced studies and professional practice in optometry and other medical sciences.

Learning Objectives

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

- 1. Demonstrate proficiency in basic laboratory techniques and safety protocols.
- 2. Analyze and interpret scientific data using appropriate statistical methods.
- 3. Communicate scientific findings effectively through written and oral presentations.
- 4. Understand and apply ethical principles in medical research.
- 5. Develop critical thinking skills to evaluate scientific literature and research methodologies.

Topics Covered

1. Introduction to Medical Research

- Overview of medical research
- Importance of research in optometry

2. Laboratory Techniques and Safety

- Basic laboratory equipment and procedures
- Laboratory safety protocols

3. Scientific Inquiry and Methodology

- Formulating research questions and hypotheses
- Designing experiments and studies

4. Data Collection and Analysis

- Methods of data collection
- Statistical analysis and interpretation

5. Scientific Communication

- Writing scientific reports and papers
- o Oral presentations and poster presentations

6. Ethics in Medical Research

- Ethical principles and guidelines
- Case studies in research ethics

7. Critical Thinking and Literature Review

- Evaluating scientific literature
- Conducting literature reviews

Assessment

- Laboratory Reports: 30%
- Midterm Exam: 20%
- Final Exam: 30%
- Oral Presentation: 10%
- Class Participation: 10%

Recommended Reading

- 1. "Research Methods for the Biosciences" by Debbie Holmes, Peter Moody, and Diana Dine
- 2. "Scientific Writing and Communication: Papers, Proposals, and Presentations" by Angelika H. Hofmann

- 3. "Biostatistics: A Foundation for Analysis in the Health Sciences" by Wayne W. Daniel and Chad L. Cross
- 4. "Principles of Biomedical Ethics" by Tom L. Beauchamp and James F. Childress

Nutrition

Course Description

This course provides an in-depth understanding of the role of nutrition in maintaining overall health and specifically in relation to eye health. Students will explore the principles of nutrition, the impact of various nutrients on the body, and the importance of a balanced diet. The course will also cover the relationship between nutrition and ocular diseases, preparing students to offer informed dietary advice to patients.

Learning Objectives

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

- 1. Understand the basic principles of nutrition and the role of different nutrients in the body.
- 2. Analyze the relationship between diet and eye health.
- 3. Identify the nutritional requirements for different stages of life and health conditions.
- 4. Evaluate the impact of nutritional deficiencies on ocular health.
- 5. Provide evidence-based dietary recommendations to promote eye health and prevent ocular diseases.

Topics Covered

1. Introduction to Nutrition

- Basic concepts and terminology
- Macronutrients and micronutrients

2. Digestive System and Nutrient Absorption

- Anatomy and physiology of the digestive system
- Processes of digestion and absorption

3. Macronutrients: Carbohydrates, Proteins, and Fats

- Functions, sources, and dietary requirements
- Impact on overall health and eye health

4. Micronutrients: Vitamins and Minerals

- Essential vitamins and minerals for eye health
- Deficiency diseases and their impact on vision

5. Nutrition and Eye Health

• Role of nutrition in preventing and managing ocular diseases

o Age-related macular degeneration, cataracts, and dry eye syndrome

6. Dietary Guidelines and Recommendations

- National and international dietary guidelines
- Creating balanced meal plans

7. Nutritional Assessment and Counseling

- Methods of nutritional assessment
- Counseling techniques for dietary modifications

8. Special Topics in Nutrition

- Nutritional needs during different life stages
- Impact of chronic diseases on nutritional requirements

9. Current Research and Trends in Nutrition

- Latest research findings
- Emerging trends and controversies in nutrition

Assessment

- Midterm Exam
- Final Exam
- Research Project
- Class Participation
- Nutritional Assessment Report

Recommended Reading

- 1. "Nutrition for Health, Fitness & Sport" by Melvin H. Williams
- 2. "Clinical Nutrition" by Michael J. Gibney, Marinos Elia, Olle Ljungqvist, and Julie Dowsett
- 3. "Nutrition and Physical Degeneration" by Weston A. Price
- 4. "Essentials of Human Nutrition" by Jim Mann and A. Stewart Truswell

Introduction to Healthcare and First Aid

Course Description

This course provides an essential foundation in healthcare principles and first aid practices, tailored for students pursuing a Bachelor of Science in Optometry. Students will gain knowledge of the healthcare system, basic medical terminology, and the skills necessary to respond to common medical emergencies. Emphasis is placed on practical first aid techniques, understanding the role of healthcare professionals, and the importance of early intervention in medical situations.

Learning Objectives

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

- 1. Understand the structure and function of the healthcare system.
- 2. Demonstrate proficiency in basic first aid techniques.
- 3. Recognize and respond to common medical emergencies.
- 4. Apply medical terminology accurately in a healthcare setting.
- 5. Understand the roles and responsibilities of various healthcare professionals.
- 6. Promote health and safety in both clinical and community settings.

Topics Covered

1. Introduction to Healthcare Systems

- Overview of healthcare systems
- Roles of healthcare professionals

2. Medical Terminology

- Basic medical terms and abbreviations
- Application of medical terminology in optometry

3. Principles of First Aid

- Fundamentals of first aid
- Legal and ethical considerations

4. Cardiopulmonary Resuscitation (CPR)

- Techniques and procedures
- Use of automated external defibrillators (AEDs)

5. Managing Common Medical Emergencies

- Wounds and bleeding
- Burns and scalds
- Fractures and sprains
- Choking and respiratory emergencies

6. First Aid for Eye Injuries

- Types of eye injuries
- Immediate care and referral procedures

7. Health Promotion and Disease Prevention

- Strategies for promoting health and safety
- Preventive measures in optometry

8. Emergency Preparedness

- Developing emergency response plans
- Role of healthcare professionals in disaster situations

Assessment

- Midterm Exam
- Final Exam
- Practical Skills Assessment
- Class Participation
- First Aid Simulation Exercises

Recommended Reading

- 1. "First Aid Manual" by the British Red Cross Society
- 2. "Essentials of Medical Terminology" by Juanita J. Davies
- 3. "First Aid for the USMLE Step 1" by Tao Le and Vikas Bhushan
- 4. "Healthcare Systems Engineering" by Paul M. Griffin and P. K. Ananth

Physics for Health Science

Course Description

This course introduces the fundamental principles of physics with a focus on applications in health sciences, particularly in optometry. Students will explore concepts such as mechanics, thermodynamics, electromagnetism, and optics, and understand their relevance to the human body and medical instruments. The course combines theoretical knowledge with practical applications to prepare students for advanced studies and professional practice in optometry.

Learning Objectives

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

- 1. Understand the basic principles of physics and their applications in health sciences.
- 2. Apply concepts of mechanics, thermodynamics, electromagnetism, and optics to biological systems and medical devices.
- 3. Analyze the physical principles underlying the function of the human eye and optical instruments.
- 4. Solve problems related to physics in a healthcare context.
- 5. Conduct experiments and interpret data in a physics laboratory setting.

Topics Covered

- 1. Introduction to Physics in Health Science
 - Overview of physics principles

• Importance of physics in health sciences

2. Mechanics

- Kinematics and dynamics
- Forces and motion
- o Applications to human movement and biomechanics

3. Thermodynamics

- Temperature and heat
- Laws of thermodynamics
- Heat transfer in biological systems

4. Electromagnetism

- Electric fields and potentials
- Magnetic fields and their effects
- o Applications in medical imaging and devices

5. Waves and Sound

- Wave properties and behavior
- Sound waves and hearing
- Ultrasound in medical diagnostics

6. Optics

- Light properties and behavior
- o Reflection, refraction, and diffraction
- Optical instruments and the human eye

7. Radiation and Nuclear Physics

- Types of radiation
- Radiation safety and protection
- o Applications in medical treatments and diagnostics

8. Laboratory Techniques and Experiments

- Conducting physics experiments
- Data collection and analysis
- Reporting and interpreting experimental results

Assessment

- Midterm Exam
- Final Exam

- Laboratory Reports
- Class Participation
- Problem Sets and Assignments

Recommended Reading

- 1. "Physics for Scientists and Engineers" by Raymond A. Serway and John W. Jewett
- 2. "Medical Physics" by John R. Cameron and James G. Skofronick
- 3. "Introduction to Health Physics" by Herman Cember and Thomas E. Johnson
- 4. "Optics" by Eugene Hecht

Molecular Basis of Life

Course Description

This course provides a comprehensive introduction to the molecular foundations of life, focusing on the biochemical and genetic principles that underpin cellular function and development. Students will explore the structure and function of biomolecules, the mechanisms of genetic information flow, and the molecular basis of diseases. The course is designed to equip students with the knowledge necessary to understand the molecular aspects of human biology, with a particular emphasis on applications in optometry.

Learning Objectives

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

- 1. Understand the structure and function of key biomolecules, including proteins, nucleic acids, lipids, and carbohydrates.
- 2. Describe the processes of DNA replication, transcription, and translation.
- 3. Explain the principles of genetic inheritance and molecular genetics.
- 4. Analyze the molecular mechanisms underlying cellular processes and signaling pathways.
- 5. Apply molecular biology concepts to understand the development and function of the visual system.
- 6. Evaluate the molecular basis of diseases and their implications for optometry.

Topics Covered

- 1. Introduction to Molecular Biology
 - Overview of molecular biology
 - Importance in health sciences and optometry

2. Biomolecules

• Structure and function of proteins, nucleic acids, lipids, and carbohydrates

• Enzyme function and kinetics

3. Genetic Information Flow

- DNA replication
- Transcription and RNA processing
- Translation and protein synthesis

4. Genetic Inheritance

- Mendelian genetics
- Molecular basis of inheritance
- Genetic variation and mutations

5. Cellular Processes and Signaling

- Cell cycle and division
- Signal transduction pathways
- Apoptosis and cell death

6. Molecular Basis of Diseases

- Genetic disorders
- Molecular mechanisms of cancer
- Infectious diseases and immune response

7. Molecular Biology of the Visual System

- Development of the eye
- Molecular mechanisms of vision
- Genetic and molecular basis of ocular diseases

8. Laboratory Techniques in Molecular Biology

- DNA extraction and analysis
- Polymerase chain reaction (PCR)
- Gel electrophoresis and blotting techniques

Assessment

- Midterm Exam
- Final Exam
- Laboratory Reports
- Class Participation
- Research Project

Recommended Reading

- 1. "Molecular Biology of the Cell" by Bruce Alberts et al.
- 2. "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox
- 3. "Molecular Genetics of Bacteria" by Larry Snyder and Wendy Champness
- 4. "Genetics: From Genes to Genomes" by Leland Hartwell et al.

Basics of Computing

Course Description

This course introduces students to the fundamental concepts of computing and information technology, with a focus on applications relevant to the field of optometry. Students will learn about computer hardware, software, data management, and basic programming. The course aims to equip students with essential computing skills that are necessary for modern optometric practice, including the use of specialized software for patient management and diagnostic tools.

Learning Objectives

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

- 1. Understand the basic components and functions of computer systems.
- 2. Use common software applications for word processing, data management, and presentations.
- 3. Apply basic programming concepts to solve simple problems.
- 4. Manage and analyze data using spreadsheets and databases.
- 5. Utilize specialized optometry software for patient management and diagnostics.
- 6. Understand the principles of cybersecurity and data privacy in healthcare.

Topics Covered

1. Introduction to Computing

- Overview of computer systems
- Hardware components and their functions
- Software types and applications

2. Operating Systems and Software Applications

- Introduction to operating systems (Windows, macOS, Linux)
- Word processing, spreadsheets, and presentation software

3. Data Management

- Basics of data storage and retrieval
- Database management systems
- Data analysis using spreadsheets

4. Introduction to Programming

- Basic programming concepts
- Writing simple programs in a high-level language (e.g., Python)
- Debugging and testing code

5. Internet and Networking

- Basics of internet and networking
- Email and web browsing
- Cloud computing and online collaboration tools

6. Specialized Software for Optometry

- Overview of optometry-specific software
- Electronic health records (EHR) systems
- Diagnostic and imaging tools

7. Cybersecurity and Data Privacy

- Principles of cybersecurity
- Protecting patient data
- Legal and ethical considerations in data privacy

Assessment

- Midterm Exam
- Final Exam
- Programming Assignments
- Data Management Projects
- Class Participation

Recommended Reading

- 1. "Computer Science: An Overview" by J. Glenn Brookshear and Dennis Brylow
- 2. "Introduction to the Practice of Statistics" by David S. Moore, George P. McCabe, and Bruce A. Craig
- 3. "Python Programming: An Introduction to Computer Science" by John Zelle
- 4. "Health Informatics: An Interprofessional Approach" by Ramona Nelson and Nancy Staggers

English for Optometry

Course Description

This course is designed to enhance the English language skills of students pursuing a Bachelor of Science in Optometry. It focuses on developing proficiency in academic and professional communication, critical reading, and writing skills. The course aims to equip students with the ability to effectively communicate in various contexts, including patient interactions, academic writing, and professional presentations.

Learning Objectives

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

- 1. Demonstrate proficiency in academic and professional English.
- 2. Develop effective communication skills for patient interactions.
- 3. Enhance critical reading and analytical skills.
- 4. Write clear and coherent academic papers and reports.
- 5. Deliver professional presentations with confidence.
- 6. Understand and use medical and optometric terminology accurately.

Topics Covered

1. Introduction to Academic English

- Overview of academic writing and communication
- Importance of English proficiency in optometry

2. Reading and Comprehension

- Strategies for critical reading
- Analyzing scientific texts and research papers

3. Writing Skills

- Academic writing conventions
- Structuring essays, reports, and research papers
- Writing case studies and patient reports

4. Medical and Optometric Terminology

- Understanding and using specialized vocabulary
- Application in clinical and academic settings

5. Communication Skills

- Effective communication with patients and colleagues
- Developing listening and speaking skills

6. Professional Presentations

- Preparing and delivering presentations
- Use of visual aids and technology

7. Research and Referencing

- Conducting literature reviews
- Proper citation and referencing techniques
- 8. Ethical and Cultural Considerations
 - Communicating with diverse populations
 - Ethical issues in medical communication

Assessment

- Midterm Exam
- Final Exam
- Writing Assignments
- Oral Presentations
- Class Participation

Recommended Reading

- 1. "Academic Writing for Graduate Students" by John M. Swales and Christine B. Feak
- 2. "English for Medical Purposes: Doctors" by Virginia Allum
- 3. "The Elements of Style" by William Strunk Jr. and E.B. White
- 4. "Medical Terminology: A Short Course" by Davi-Ellen Chabner

Basics of Computing Practical

Course Description

This practical course is designed to provide students with hands-on experience in computing skills essential for the field of optometry. Students will learn to use various software applications, manage data, and perform basic programming tasks. The course emphasizes practical applications of computing in optometric practice, including patient management systems and diagnostic tools.

Learning Objectives

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

- 1. Operate common software applications for word processing, data management, and presentations.
- 2. Perform basic programming tasks and understand fundamental programming concepts.
- 3. Manage and analyze data using spreadsheets and databases.
- 4. Utilize specialized optometry software for patient management and diagnostics.
- 5. Apply computing skills to solve practical problems in optometry.

Topics Covered

1. Introduction to Computing

- Overview of computer systems and hardware
- Introduction to operating systems (Windows, macOS, Linux)

2. Software Applications

- Word processing (e.g., Microsoft Word)
- Spreadsheets (e.g., Microsoft Excel)
- Presentation software (e.g., Microsoft PowerPoint)

3. Data Management

- Basics of data storage and retrieval
- Database management systems
- Data analysis using spreadsheets

4. Basic Programming

- Introduction to programming languages (e.g., Python)
- Writing and debugging simple programs
- Practical applications of programming in optometry

5. Specialized Optometry Software

- Overview of optometry-specific software
- Electronic health records (EHR) systems
- Diagnostic and imaging tools

6. Internet and Networking

- Basics of internet and networking
- Email and web browsing
- o Cloud computing and online collaboration tools

7. Cybersecurity and Data Privacy

- Principles of cybersecurity
- Protecting patient data
- Legal and ethical considerations in data privacy

Assessment

- Practical Assignments
- Programming Projects
- Data Management Exercises
- Class Participation

• Final Practical Exam

Recommended Reading

- 1. "Computer Science: An Overview" by J. Glenn Brookshear and Dennis Brylow
- 2. "Python Programming: An Introduction to Computer Science" by John Zelle
- 3. "Introduction to the Practice of Statistics" by David S. Moore, George P. McCabe, and Bruce A. Craig
- 4. "Health Informatics: An Interprofessional Approach" by Ramona Nelson and Nancy Staggers

Human Anatomy and Physiology I Practical

Course Description

This practical course complements the theoretical discussions in Human Anatomy and Physiology I. It provides hands-on experience with anatomical structures and physiological processes, allowing students to verify and deepen their understanding through direct observation and experimentation. The course emphasizes the practical skills necessary for optometric practice, including the use of microscopes, identification of tissues and organs, and basic physiological measurements.

Learning Objectives

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

- 1. Identify and describe the structure of various tissues and organs using a microscope.
- 2. Perform basic physiological measurements and interpret the results.
- 3. Understand the anatomical and physiological basis of common clinical procedures.
- 4. Develop practical skills in handling laboratory equipment and specimens.
- 5. Apply theoretical knowledge to practical scenarios in optometry.

Topics Covered

- 1. Introduction to Laboratory Safety and Equipment
 - Laboratory safety protocols
 - Use and care of microscopes and other laboratory equipment

2. Microscopic Study of Tissues

- Epithelial tissue
- Connective tissue
- o Muscular tissue
- Nervous tissue

3. Skeletal System

o Identification of axial and appendicular bones

• Bone histology

4. Muscular System

- Muscle tissue types and histology
- Mechanisms of muscle contraction

5. Nervous System

- Neuron structure and function
- Microscopic study of nervous tissue

6. Cardiovascular System

- Heart anatomy and histology
- Blood vessel structure
- o Measurement of heart rate and blood pressure

7. Respiratory System

- Lung anatomy and histology
- o Measurement of respiratory rate

8. Digestive System

- Anatomy and histology of digestive organs
- Enzyme activity experiments

9. Urinary System

- Kidney structure and histology
- Urine analysis

10. Blood and Hematology

- Blood cell identification
- Hemoglobin estimation
- Blood typing and clotting time

11. Visual System

- Anatomy of the eye
- Microscopic study of ocular tissues

Assessment

- Laboratory Reports
- Practical Exams
- Class Participation
- Skill Demonstrations
Recommended Reading

- 1. "Essentials of Medical Physiology" by K. Sembulingam and P. Sembulingam
- 2. "Anatomy and Physiology in Health and Illness" by Kathleen J.W. Wilson
- 3. "Principles of Anatomy and Physiology" by Gerard J. Tortora and Bryan H. Derrickson
- 4. "Textbook of Practical Physiology" by C.L. Ghai

Introduction to Healthcare and First Aid Practical

Course Description

This practical course is designed to provide students with hands-on experience in healthcare and first aid techniques essential for optometric practice. Students will learn to apply theoretical knowledge in real-world scenarios, developing skills in emergency response, patient care, and basic medical procedures. The course emphasizes practical applications and prepares students to handle common medical emergencies they may encounter in their professional careers.

Learning Objectives

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

- 1. Demonstrate proficiency in basic first aid techniques.
- 2. Respond effectively to common medical emergencies.
- 3. Apply healthcare principles in practical scenarios.
- 4. Perform basic medical procedures relevant to optometry.
- 5. Understand and implement safety protocols in emergency situations.

Topics Covered

1. Introduction to First Aid and Healthcare

- Overview of first aid principles
- o Importance of first aid in optometry

2. Basic Life Support (BLS)

- Cardiopulmonary resuscitation (CPR)
- Use of automated external defibrillators (AEDs)

3. Managing Common Medical Emergencies

- Wounds and bleeding control
- Burns and scalds
- Fractures and sprains
- Choking and respiratory emergencies

4. First Aid for Eye Injuries

- Types of eye injuries
- Immediate care and referral procedures

5. Patient Assessment and Care

- Conducting primary and secondary surveys
- Monitoring vital signs
- Providing basic patient care

6. Health and Safety Protocols

- Infection control and hygiene practices
- Legal and ethical considerations in first aid

7. Emergency Preparedness

- Developing emergency response plans
- Role of healthcare professionals in disaster situations

Assessment

- Practical Skills Assessment
- Simulation Exercises
- Class Participation
- Practical Exams

Recommended Reading

- 1. "First Aid Manual" by the British Red Cross Society
- 2. "Emergency Care and Transportation of the Sick and Injured" by the American Academy of Orthopaedic Surgeons (AAOS)
- 3. "First Aid for the USMLE Step 1" by Tao Le and Vikas Bhushan
- 4. "Essentials of Medical Terminology" by Juanita J. Davies

Human Anatomy and Physiology II

Course Description

This course is a continuation of Human Anatomy and Physiology I, providing an in-depth study of the human body's systems with a focus on those relevant to optometry. Students will explore the structure and function of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. The course combines theoretical knowledge with practical applications to prepare students for advanced studies and professional practice in optometry.

Learning Objectives

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

- 1. Describe the structure and function of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.
- 2. Understand the physiological processes that maintain homeostasis within these systems.
- 3. Apply anatomical and physiological concepts to clinical scenarios in optometry.
- 4. Analyze the interrelationships between different body systems.
- 5. Develop a comprehensive understanding of the physiological basis of common diseases and disorders.

Topics Covered

1. Endocrine System

- Hormone function and regulation
- Major endocrine glands and their roles

2. Cardiovascular System

- Heart anatomy and physiology
- Blood vessels and circulation
- Blood composition and functions

3. Lymphatic and Immune Systems

- Structure and function of the lymphatic system
- Immune response and defense mechanisms

4. Respiratory System

- Anatomy of the respiratory tract
- Mechanisms of breathing and gas exchange

5. Digestive System

- Anatomy and physiology of digestive organs
- Processes of digestion and absorption

6. Urinary System

- Kidney structure and function
- Urine formation and excretion

7. Reproductive System

- Male and female reproductive anatomy
- Reproductive physiology and hormonal regulation

8. Integration of Systems

• Interrelationships between body systems

• Homeostasis and physiological regulation

Assessment

- Midterm Exam
- Final Exam
- Lab Reports
- Class Participation
- Case Studies and Presentations

Recommended Reading

- 1. "Human Anatomy & Physiology" by Elaine N. Marieb and Katja Hoehn
- 2. "Principles of Anatomy and Physiology" by Gerard J. Tortora and Bryan H. Derrickson
- 3. "Essentials of Anatomy and Physiology" by Valerie C. Scanlon and Tina Sanders
- 4. "Clinical Anatomy and Physiology of the Visual System" by Lee Ann Remington

Biochemistry

Course Description

This course provides a comprehensive introduction to the principles of biochemistry, focusing on the molecular mechanisms that underlie the structure and function of biological molecules. Students will explore the biochemical processes essential for life, with an emphasis on their relevance to human health and disease, particularly in the context of optometry. The course combines theoretical knowledge with practical applications to prepare students for advanced studies and professional practice in optometry.

Learning Objectives

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

- 1. Understand the structure and function of key biomolecules, including proteins, nucleic acids, lipids, and carbohydrates.
- 2. Describe the biochemical pathways involved in metabolism and energy production.
- 3. Analyze the molecular mechanisms of enzyme action and regulation.
- 4. Explain the principles of genetic information flow and molecular genetics.
- 5. Apply biochemical concepts to understand the molecular basis of ocular health and disease.
- 6. Conduct basic biochemical experiments and interpret the results.

Topics Covered

1. Introduction to Biochemistry

- Overview of biochemistry
- Importance in health sciences and optometry

2. Biomolecules

- Structure and function of proteins, nucleic acids, lipids, and carbohydrates
- Enzyme function and kinetics

3. Metabolism and Bioenergetics

- o Glycolysis, Krebs cycle, and oxidative phosphorylation
- Metabolic pathways and their regulation

4. Enzyme Action and Regulation

- Mechanisms of enzyme action
- Factors affecting enzyme activity
- Enzyme inhibition and regulation

5. Genetic Information Flow

- DNA replication
- Transcription and RNA processing
- Translation and protein synthesis

6. Molecular Genetics

- Genetic inheritance and variation
- Molecular basis of genetic disorders

7. Biochemistry of the Visual System

- Biochemical processes in the eye
- Molecular mechanisms of vision
- Biochemical basis of ocular diseases

8. Laboratory Techniques in Biochemistry

- Protein purification and analysis
- Nucleic acid extraction and analysis
- Enzyme assays and kinetics

Assessment

- Midterm Exam
- Final Exam
- Laboratory Reports
- Class Participation

Research Project

Recommended Reading

- 1. "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox
- 2. "Biochemistry" by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer
- 3. "Molecular Biology of the Cell" by Bruce Alberts et al.
- 4. "Clinical Biochemistry: An Illustrated Colour Text" by Allan Gaw et al.

Pharmacology

Course Description

This course provides an in-depth understanding of pharmacology, focusing on the principles of drug action, pharmacokinetics, and pharmacodynamics. Students will explore the therapeutic applications and adverse effects of various drug classes, with a particular emphasis on medications used in optometry. The course aims to equip students with the knowledge necessary to understand and apply pharmacological principles in clinical practice.

Learning Objectives

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

- 1. Understand the basic principles of pharmacology, including pharmacokinetics and pharmacodynamics.
- 2. Identify the therapeutic uses and mechanisms of action of major drug classes.
- 3. Recognize and manage adverse drug reactions and interactions.
- 4. Apply pharmacological knowledge to clinical scenarios in optometry.
- 5. Understand the regulatory and ethical considerations in the use of medications.

Topics Covered

1. Introduction to Pharmacology

- Overview of pharmacology
- Drug nomenclature and classification

2. Pharmacokinetics

- Absorption, distribution, metabolism, and excretion of drugs
- Factors affecting pharmacokinetics

3. Pharmacodynamics

- Mechanisms of drug action
- Dose-response relationships

4. Autonomic Pharmacology

• Drugs affecting the autonomic nervous system

• Therapeutic applications and side effects

5. Cardiovascular Pharmacology

- Drugs used in the treatment of cardiovascular diseases
- Mechanisms of action and clinical applications

6. Central Nervous System Pharmacology

- Drugs affecting the central nervous system
- Therapeutic uses and adverse effects

7. Anti-inflammatory and Analgesic Drugs

- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Opioids and other analgesics

8. Antimicrobial Agents

- Antibiotics, antivirals, antifungals, and antiparasitics
- Mechanisms of action and resistance

9. Ocular Pharmacology

- o Drugs used in the treatment of ocular diseases
- Mechanisms of action and clinical applications

10. Endocrine Pharmacology

- Drugs affecting the endocrine system
- Therapeutic uses and side effects

11. Chemotherapy and Immunopharmacology

- Anticancer drugs
- Immunosuppressive agents

12. Regulatory and Ethical Considerations

- Drug regulation and approval processes
- Ethical issues in pharmacology

Assessment

- Midterm Exam
- Final Exam
- Case Studies
- Class Participation
- Research Project

Recommended Reading

- 1. "Rang & Dale's Pharmacology" by James M. Ritter, Rod J. Flower, Graeme Henderson, and Yoon Kong Loke
- 2. "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence Brunton, Bjorn Knollmann, and Randa Hilal-Dandan
- 3. "Basic and Clinical Pharmacology" by Bertram Katzung, Anthony Trevor, and Susan Masters
- 4. "Clinical Ocular Pharmacology" by Jimmy D. Bartlett and Siret D. Jaanus

Chemistry for Life Sciences

Course Description

This course provides a foundational understanding of chemistry with a focus on its applications in the life sciences. Students will explore the principles of general, organic, and biological chemistry, emphasizing their relevance to biological systems and optometry. The course aims to equip students with the chemical knowledge necessary to understand biochemical processes and the molecular basis of health and disease.

Learning Objectives

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

- 1. Understand the basic principles of general, organic, and biological chemistry.
- 2. Apply chemical concepts to biological systems and processes.
- 3. Analyze the structure and function of biomolecules.
- 4. Understand the chemical basis of metabolic pathways and energy production.
- 5. Apply knowledge of chemistry to understand the molecular basis of ocular health and disease.

Topics Covered

1. Introduction to Chemistry

- Basic concepts and terminology
- Atomic structure and periodic table

2. Chemical Bonding and Molecular Structure

- Types of chemical bonds
- Molecular geometry and polarity

3. Chemical Reactions and Stoichiometry

- Types of chemical reactions
- Balancing chemical equations
- Stoichiometric calculations
- 4. Thermochemistry

- Energy changes in chemical reactions
- Enthalpy, entropy, and free energy

5. Chemical Kinetics and Equilibrium

- Reaction rates and mechanisms
- Chemical equilibrium and Le Chatelier's principle

6. Acids, Bases, and Buffers

- Properties of acids and bases
- o pH and pKa
- Buffer solutions and their importance in biological systems

7. Organic Chemistry

- o Structure and function of organic molecules
- Functional groups and their reactivity
- Introduction to biomolecules (carbohydrates, lipids, proteins, nucleic acids)

8. Biochemistry

- Structure and function of biomolecules
- Enzyme kinetics and mechanisms
- Metabolic pathways and energy production

9. Chemistry of the Visual System

- Biochemical processes in the eye
- Molecular mechanisms of vision
- Chemical basis of ocular diseases

Assessment

- Midterm Exam
- Final Exam
- Laboratory Reports
- Class Participation
- Problem Sets and Assignments

Recommended Reading

- 1. "Chemistry: The Central Science" by Theodore L. Brown, H. Eugene LeMay, Bruce E. Bursten, and Catherine Murphy
- 2. "Organic Chemistry" by Paula Yurkanis Bruice
- 3. "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox
- 4. "Biochemistry" by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer

Communication for Academic Purposes

Course Description

This course is designed to enhance students' academic communication skills, focusing on the specific needs of those pursuing a Bachelor of Science in Optometry. Students will develop proficiency in reading, writing, speaking, and listening in academic contexts. The course emphasizes the importance of clear and effective communication in both academic and professional settings, preparing students to excel in their studies and future careers.

Learning Objectives

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

- 1. Demonstrate effective academic writing skills, including structuring essays and research papers.
- 2. Develop critical reading and analytical skills for understanding scientific texts.
- 3. Enhance oral communication skills for presentations and discussions.
- 4. Improve listening skills for academic lectures and professional interactions.
- 5. Apply appropriate academic vocabulary and terminology in written and spoken communication.
- 6. Understand and use citation and referencing techniques to avoid plagiarism.

Topics Covered

1. Introduction to Academic Communication

- Importance of communication skills in optometry
- Overview of academic communication

2. Academic Writing

- Essay and research paper structure
- Writing clear and coherent arguments
- Editing and proofreading techniques

3. Critical Reading and Analysis

- o Strategies for reading scientific texts
- Analyzing and summarizing research articles
- Critical thinking and evaluation

4. Oral Communication

- Preparing and delivering presentations
- Participating in academic discussions
- Public speaking skills

5. Listening Skills

- Effective listening strategies
- Note-taking techniques for lectures
- Understanding and responding to spoken information

6. Academic Vocabulary and Terminology

- Building academic vocabulary
- Using optometric and medical terminology accurately

7. Citation and Referencing

- Importance of proper citation
- Different referencing styles (APA, MLA, etc.)
- Avoiding plagiarism

Assessment

- Writing Assignments
- Oral Presentations
- Reading Comprehension Exercises
- Class Participation
- Final Project

Recommended Reading

- 1. "Academic Writing for Graduate Students" by John M. Swales and Christine B. Feak
- 2. "The Elements of Style" by William Strunk Jr. and E.B. White
- 3. "English for Academic Purposes: A Guide and Resource Book for Teachers" by R.R. Jordan
- 4. "Effective Communication Skills for Health Professionals" by Philip Burnard

Human Anatomy and Physiology II Practical

Course Description

This course provides hands-on experience in human anatomy and physiology, focusing on the systems relevant to optometry. Students will engage in practical exercises to understand the structure and function of the human body, with an emphasis on the nervous, endocrine, cardiovascular, respiratory, digestive, urinary, and reproductive systems. The course aims to complement theoretical knowledge with practical skills essential for optometry practice.

Learning Objectives

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

- 1. Demonstrate a thorough understanding of human anatomy and physiology through practical exercises.
- 2. Perform and interpret various physiological tests and measurements.
- 3. Identify and describe the anatomical structures and physiological functions of the human body.
- 4. Apply practical knowledge to clinical scenarios relevant to optometry.
- 5. Develop skills in using laboratory equipment and techniques.

Topics Covered

- 1. Nervous System
 - o Structure and function of the central and peripheral nervous systems
 - Neurological examinations
 - Reflex activities

2. Endocrine System

- Hormone functions and feedback mechanisms
- Examination of endocrine glands

3. Cardiovascular System

- Heart anatomy and physiology
- Blood pressure measurement
- ECG interpretation

4. Respiratory System

- Lung anatomy and physiology
- Measurement of respiratory volumes and capacities

5. Digestive System

- Anatomy of the digestive tract
- Enzyme activity and digestion processes

6. Urinary System

- Kidney structure and function
- o Urinalysis

7. Reproductive System

- Male and female reproductive anatomy
- Reproductive physiology

Assessment

• **Practical Exams**: 40%

- Lab Reports: 30%
- Quizzes: 20%
- **Participation and Attendance**: 10%

Recommended Reading

- 1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam
- 2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson
- 3. Textbook of Medical Physiology by Arthur C. Guyton and John E. Hall
- 4. **Principles of Anatomy and Physiology** by Gerard J. Tortora and Bryan H. Derrickson
- 5. Textbook of Human Histology by Inderbir Singh
- 6. Practical Workbook of Human Physiology by K. Srinageswari and Rajeev Sharma

Biochemistry Practical

Course Description

This course provides practical laboratory experience in biochemistry, focusing on the biochemical processes and molecules relevant to optometry. Students will perform experiments to understand the chemical basis of life, including the structure and function of biomolecules, metabolic pathways, and the biochemical mechanisms underlying physiological processes. The course aims to enhance students' practical skills and their ability to apply biochemical knowledge in clinical settings.

Learning Objectives

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

- 1. Conduct biochemical experiments and accurately record and analyze data.
- 2. Understand the structure and function of key biomolecules.
- 3. Explain the biochemical pathways and their relevance to human physiology.
- 4. Apply biochemical principles to clinical scenarios in optometry.
- 5. Utilize laboratory techniques and equipment proficiently.

Topics Covered

- 1. Introduction to Biochemical Laboratory Techniques
 - Safety protocols
 - Use of laboratory equipment

2. Proteins and Enzymes

- Protein structure and function
- Enzyme kinetics and inhibition

• Protein purification and analysis

3. Carbohydrates

- Structure and function of carbohydrates
- Glycolysis and gluconeogenesis
- Carbohydrate metabolism

4. Lipids

- Structure and function of lipids
- Lipid metabolism
- Cholesterol and lipoproteins

5. Nucleic Acids

- DNA and RNA structure
- o DNA replication and repair
- Transcription and translation

6. Metabolic Pathways

- Citric acid cycle
- Oxidative phosphorylation
- Metabolic regulation

7. Clinical Biochemistry

- Biochemical markers in disease
- Diagnostic techniques
- Case studies relevant to optometry

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Biochemistry by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer
- 2. Lehninger Principles of Biochemistry by David L. Nelson and Michael M. Cox
- 3. **Harper's Illustrated Biochemistry** by Victor W. Rodwell, David Bender, Kathleen M. Botham, Peter J. Kennelly, and P. Anthony Weil
- 4. Clinical Chemistry: Principles, Techniques, and Correlations by Michael L. Bishop, Edward P. Fody, and Larry E. Schoeff

5. Biochemical Calculations by Irwin H. Segel

Pharmacology Practical

Course Description

This course offers hands-on laboratory experience in pharmacology, focusing on the pharmacological principles and drug actions relevant to optometry. Students will conduct experiments to understand drug interactions, mechanisms of action, and therapeutic applications. The course aims to bridge theoretical pharmacology with practical skills necessary for clinical practice in optometry.

Learning Objectives

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

- 1. Perform pharmacological experiments and accurately record and analyze data.
- 2. Understand the mechanisms of action of various drugs.
- 3. Explain the pharmacokinetics and pharmacodynamics of drugs used in optometry.
- 4. Apply pharmacological principles to clinical scenarios in optometry.
- 5. Utilize laboratory techniques and equipment proficiently.

Topics Covered

1. Introduction to Pharmacological Laboratory Techniques

- Safety protocols
- Use of laboratory equipment

2. Drug-Receptor Interactions

- Receptor theory
- Agonists and antagonists
- Dose-response relationships

3. Pharmacokinetics

- Absorption, distribution, metabolism, and excretion (ADME)
- o Bioavailability and half-life
- Drug interactions

4. Pharmacodynamics

- Mechanisms of drug action
- Therapeutic and toxic effects
- Drug efficacy and potency

5. Autonomic Pharmacology

o Drugs affecting the autonomic nervous system

- Sympathomimetics and parasympathomimetics
- Clinical applications in optometry

6. Ocular Pharmacology

- Drugs used in the treatment of ocular diseases
- Anti-inflammatory and anti-infective agents
- o Mydriatics and cycloplegics

7. Clinical Pharmacology

- Case studies relevant to optometry
- Adverse drug reactions
- Drug monitoring and patient compliance

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. **Rang & Dale's Pharmacology** by James M. Ritter, Rod J. Flower, Graeme Henderson, and Yoon Kong Loke
- 2. **Goodman & Gilman's: The Pharmacological Basis of Therapeutics** by Laurence Brunton, Bjorn Knollmann, and Randa Hilal-Dandan
- 3. **Basic and Clinical Pharmacology** by Bertram Katzung, Anthony Trevor, and Susan Masters
- 4. Clinical Ocular Pharmacology by Jimmy D. Bartlett and Siret D. Jaanus
- 5. **Essentials of Pharmacology for Health Professions** by Bruce Colbert, Ruth Woodrow, and David Smith

Comprehensive Viva

Course Description

The Comprehensive Viva course is designed to assess the cumulative knowledge and skills acquired by students throughout their Bachelor of Science in Optometry program. This oral examination will cover all major areas of optometry, including theoretical knowledge, practical skills, and clinical applications. The course aims to prepare students for professional practice by evaluating their ability to integrate and apply their learning in a comprehensive manner.

Learning Objectives

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

- 1. Demonstrate a thorough understanding of key concepts in optometry.
- 2. Integrate theoretical knowledge with practical skills in clinical scenarios.
- 3. Communicate effectively and confidently in an oral examination setting.
- 4. Critically analyze and solve complex problems related to optometry.
- 5. Exhibit professionalism and ethical decision-making in clinical practice.

Topics Covered

- 1. Ocular Anatomy and Physiology
 - Structure and function of the eye
 - Visual pathways and processing

2. Optics and Refraction

- Principles of optics
- Refractive errors and their correction

3. Clinical Optometry

- Eye examination techniques
- Diagnostic procedures

4. Ocular Diseases and Management

- Common ocular diseases
- Treatment and management strategies

5. Pharmacology

- Drugs used in optometry
- Mechanisms of action and side effects

6. Contact Lenses

- Types of contact lenses
- Fitting and care

7. Binocular Vision and Pediatric Optometry

- Binocular vision disorders
- Pediatric eye care

8. Low Vision and Rehabilitation

- Low vision aids
- Rehabilitation techniques

Assessment

• **Oral Examination**: Students will be assessed through a comprehensive oral examination covering all major topics in optometry. The examination will evaluate their knowledge, problem-solving abilities, and communication skills.

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. **Optometry: Science, Techniques and Clinical Management** by Mark Rosenfield and Nicola Logan
- 3. Clinical Optics by Troy E. Fannin and Theodore Grosvenor
- 4. **Ocular Disease: Mechanisms and Management** by Leonard A. Levin, Siv F. E. Nilsson, James Ver Hoeve, and Samuel Wu
- 5. Foundations of Binocular Vision: A Clinical Perspective by Bruce J. W. Evans

Ocular Anatomy and Physiology

Course Description

This course provides an in-depth study of the anatomy and physiology of the human eye and its associated structures. Students will explore the detailed structure and function of ocular tissues, the visual pathways, and the physiological processes that support vision. The course aims to equip students with a comprehensive understanding of ocular anatomy and physiology, essential for clinical practice in optometry.

Learning Objectives

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

- 1. Identify and describe the anatomical structures of the eye and surrounding tissues.
- 2. Understand the physiological processes involved in vision.
- 3. Analyze the relationships between ocular structures and their functions.
- 4. Recognize how ocular tissues and structures can differ between normal and disease states.
- 5. Apply anatomical and physiological knowledge to clinical scenarios in optometry.

Topics Covered

- 1. Introduction to Ocular Anatomy
 - Overview of the eye and its components
 - Gross anatomy of the eye

2. Ocular Tissues and Structures

- Cornea, sclera, and conjunctiva
- Lens and ciliary body
- Retina and choroid

3. Visual Pathways

- Anatomy of the optic nerve
- Visual processing in the brain

4. Ocular Physiology

- Tear film and ocular surface
- Aqueous humor dynamics and intraocular pressure
- Pupil function and accommodation

5. Vascular and Neural Supply

- Blood supply to the eye
- Neural innervation of ocular structures

6. Ocular Development and Aging

- Embryology of the eye
- Age-related changes in ocular anatomy and physiology

7. Clinical Applications

- Common ocular diseases and their anatomical basis
- Diagnostic imaging techniques

Assessment

- Written Exams
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Anatomy of the Eye by Richard S. Snell and Michael A. Lemp
- 2. Adler's Physiology of the Eye by Leonard A. Levin, Siv F. E. Nilsson, James Ver Hoeve, and Samuel Wu
- 3. **Ocular Anatomy and Physiology** by Al Lens, Sheila Coyne Nemeth, and Janice K. Ledford
- 4. Basic and Clinical Science Course (BCSC) Section 2: Fundamentals and Principles of Ophthalmology by the American Academy of Ophthalmology
- 5. **The Eye: Basic Sciences in Practice** by John V. Forrester, Andrew D. Dick, Paul G. McMenamin, and William R. Lee

Ocular Pharmacology, Microbiology, and Clinical Pathology

Course Description

This course integrates the study of pharmacology, microbiology, and clinical pathology with a focus on their applications in optometry. Students will explore the pharmacological treatments for ocular diseases, the role of microorganisms in eye infections, and the pathological basis of ocular conditions. The course aims to provide a comprehensive understanding of these disciplines to enhance clinical decision-making and patient care in optometry.

Learning Objectives

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

- 1. Understand the pharmacokinetics and pharmacodynamics of drugs used in ocular treatments.
- 2. Identify and describe the microorganisms that cause ocular infections.
- 3. Analyze the pathological changes associated with common ocular diseases.
- 4. Apply pharmacological, microbiological, and pathological knowledge to clinical scenarios in optometry.
- 5. Utilize laboratory techniques to diagnose and manage ocular conditions.

Topics Covered

1. Ocular Pharmacology

- Drug absorption, distribution, metabolism, and excretion (ADME)
- Mechanisms of action of ocular drugs
- o Therapeutic uses and side effects of drugs in optometry
- Anti-inflammatory, anti-infective, and anti-glaucoma agents

2. Ocular Microbiology

- Common pathogens in ocular infections
- Diagnostic techniques for microbial identification
- Antimicrobial resistance and treatment strategies
- Infection control and prevention in clinical practice

3. Clinical Pathology

- Pathological basis of ocular diseases
- Histopathological techniques and interpretation
- Laboratory diagnosis of ocular conditions
- Case studies of common ocular pathologies

Assessment

- Lab Reports
- Practical Exams
- Quizzes

• Participation and Attendance

Recommended Reading

- 1. Clinical Ocular Pharmacology by Jimmy D. Bartlett and Siret D. Jaanus
- 2. Medical Microbiology by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller
- 3. **Basic and Clinical Pharmacology** by Bertram Katzung, Anthony Trevor, and Susan Masters
- 4. Clinical Pathology for the Health Professions by Peggy A. Simpson
- 5. Essentials of Medical Microbiology by Apurba Sankar Sastry and Sandhya Bhat

Physiological Optics and Principle of Refraction

Course Description

This course provides an in-depth understanding of the principles of optics and refraction, focusing on their physiological applications in optometry. Students will explore the behavior of light, optical systems, and the refractive properties of the eye. The course aims to equip students with the knowledge and skills necessary to understand and apply optical principles in clinical practice.

Learning Objectives

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

- 1. Understand the fundamental principles of light and optics.
- 2. Apply the laws of refraction and reflection to optical systems.
- 3. Analyze the optical properties of the eye and visual system.
- 4. Utilize optical instruments and techniques in clinical settings.
- 5. Solve complex problems related to physiological optics and refraction.

Topics Covered

1. Introduction to Optics

- Nature of light
- Wave and particle theories
- Electromagnetic spectrum

2. Geometrical Optics

- Reflection and refraction
- o Snell's law
- Optical interfaces and surfaces

3. Optical Systems

• Lenses and mirrors

- Optical instruments (microscopes, telescopes)
- Magnification and image formation

4. Physiological Optics

- Optical properties of the eye
- Visual acuity and resolution
- Accommodation and convergence

5. Principles of Refraction

- Refractive errors (myopia, hyperopia, astigmatism)
- Corrective lenses and contact lenses
- Refractive surgery

6. Clinical Applications

- Diagnostic techniques (retinoscopy, keratometry)
- Optical coherence tomography (OCT)
- Case studies in refraction and optics

Assessment

- Written Exams
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Optics by Troy E. Fannin and Theodore Grosvenor
- 2. Optics for Clinicians by David G. Hunter and Constance E. West
- 3. Geometrical and Visual Optics: A Clinical Introduction by Steven H. Schwartz
- 4. Principles of Optics by Max Born and Emil Wolf
- 5. Clinical Procedures in Primary Eye Care by David B. Elliott

Ophthalmic Instruments

Course Description

This course provides an in-depth study of the various instruments used in the field of optometry. Students will learn about the design, function, and application of ophthalmic instruments in clinical practice. The course aims to equip students with the knowledge and skills necessary to operate and maintain these instruments, ensuring accurate diagnosis and effective patient care.

Learning Objectives

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

- 1. Identify and describe the function of key ophthalmic instruments.
- 2. Understand the principles behind the operation of these instruments.
- 3. Demonstrate proficiency in using ophthalmic instruments for diagnostic and therapeutic purposes.
- 4. Maintain and troubleshoot common issues with ophthalmic instruments.
- 5. Apply knowledge of ophthalmic instruments to clinical scenarios in optometry.

Topics Covered

1. Introduction to Ophthalmic Instruments

- Overview of common ophthalmic instruments
- Safety protocols and handling

2. Diagnostic Instruments

- Slit lamp biomicroscope
- Keratometer
- Tonometer
- Retinoscope
- Ophthalmoscope

3. Imaging Instruments

- Fundus camera
- Optical coherence tomography (OCT)
- Ultrasound biomicroscopy
- Corneal topography

4. Refractive Instruments

- Phoropter
- o Autorefractor
- o Lensometer

5. Therapeutic Instruments

- Laser systems (e.g., YAG laser)
- Cryotherapy instruments
- Electrocautery devices

6. Maintenance and Troubleshooting

• Routine maintenance procedures

- Common troubleshooting techniques
- Calibration and quality control

7. Clinical Applications

- Case studies involving the use of ophthalmic instruments
- o Integration of diagnostic data into patient management

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. Ophthalmic Instruments and Diagnostic Procedures by Michael W. Risco
- 3. **Atlas of Clinical Ophthalmology** by David J. Spalton, Roger A. Hitchings, and Paul Hunter
- 4. **Ophthalmic Clinical Procedures: A Multimedia Guide** by Janice K. Ledford and Valerie M. Sanders
- 5. The Slit Lamp Primer by Janice K. Ledford

Communication for Professional Purposes

Course Description

This course focuses on developing effective communication skills essential for professional practice in optometry. Students will learn various communication strategies to interact with patients, colleagues, and other healthcare professionals. The course aims to enhance students' ability to convey information clearly, empathetically, and professionally in clinical settings.

Learning Objectives

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

- 1. Demonstrate effective verbal and non-verbal communication skills.
- 2. Communicate complex information clearly and concisely to patients and colleagues.
- 3. Apply active listening techniques to understand and address patient concerns.
- 4. Utilize professional communication strategies in various clinical scenarios.
- 5. Exhibit cultural competence and empathy in patient interactions.

Topics Covered

1. Introduction to Professional Communication

- Importance of communication in optometry
- o Basic communication models and theories

2. Verbal Communication Skills

- Techniques for clear and concise communication
- Explaining diagnoses and treatment plans to patients

3. Non-Verbal Communication

- Body language and eye contact
- Building rapport with patients

4. Active Listening

- Techniques for active listening
- Addressing patient concerns and questions

5. Written Communication

- Writing professional emails and reports
- o Documentation and record-keeping

6. Interprofessional Communication

- Communicating with other healthcare professionals
- Collaborative care and teamwork

7. Cultural Competence

- Understanding cultural differences in communication
- Providing culturally sensitive care

8. Ethical and Legal Aspects

- o Confidentiality and informed consent
- Ethical considerations in communication

Assessment

- Role-Playing Exercises
- Written Assignments
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Communication Skills for the Healthcare Professional by Laurie Kelly McCorry and Jeff Mason
- 2. Effective Communication Skills for Health Professionals by Philip Burnard
- 3. Interpersonal Communication in Nursing by Shirley Bach and Alec Grant

- 4. The Skilled Helper: A Problem-Management and Opportunity-Development Approach to Helping by Gerard Egan
- 5. Cultural Competence in Health Care: A Practical Guide by Patti R. Rose

Ocular Anatomy and Physiology Practical

Course Description

This course provides hands-on experience in the anatomical and physiological study of the human eye and its associated structures. Students will engage in practical exercises to explore the detailed structure and function of ocular tissues, the visual pathways, and the physiological processes that support vision. The course aims to complement theoretical knowledge with practical skills essential for clinical practice in optometry.

Learning Objectives

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

- 1. Identify and describe the anatomical structures of the eye and surrounding tissues through practical exercises.
- 2. Understand and demonstrate the physiological processes involved in vision.
- 3. Perform and interpret various physiological tests and measurements related to ocular health.
- 4. Apply practical knowledge to clinical scenarios relevant to optometry.
- 5. Develop proficiency in using laboratory equipment and techniques specific to ocular anatomy and physiology.

Topics Covered

1. Introduction to Ocular Anatomy and Physiology

- Overview of the eye and its components
- Safety protocols in the laboratory

2. Microscopic Anatomy of Ocular Tissues

- Histology of the cornea, sclera, and conjunctiva
- Microscopic examination of the retina and choroid

3. Visual Pathways and Processing

- Anatomy of the optic nerve
- Visual processing in the brain

4. Physiological Processes

- Tear film and ocular surface dynamics
- Aqueous humor production and drainage
- Pupil function and accommodation

5. Vascular and Neural Supply

- Blood supply to the eye
- Neural innervation of ocular structures

6. Ocular Development and Aging

- Embryology of the eye
- Age-related changes in ocular anatomy and physiology

7. Clinical Applications

- Common ocular diseases and their anatomical basis
- Diagnostic imaging techniques

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Anatomy of the Eye by Richard S. Snell and Michael A. Lemp
- 2. Adler's Physiology of the Eye by Leonard A. Levin, Siv F. E. Nilsson, James Ver Hoeve, and Samuel Wu
- 3. **Ocular Anatomy and Physiology** by Al Lens, Sheila Coyne Nemeth, and Janice K. Ledford
- 4. Basic and Clinical Science Course (BCSC) Section 2: Fundamentals and Principles of Ophthalmology by the American Academy of Ophthalmology
- 5. **The Eye: Basic Sciences in Practice** by John V. Forrester, Andrew D. Dick, Paul G. McMenamin, and William R. Lee

Ocular Pharmacology, Microbiology, and Clinical Pathology Practical

Course Description

This course provides practical laboratory experience in ocular pharmacology, microbiology, and clinical pathology, focusing on their applications in optometry. Students will perform experiments to understand drug actions, identify microorganisms causing ocular infections, and analyze pathological changes in ocular tissues. The course aims to enhance students' practical skills and their ability to apply this knowledge in clinical settings.

Learning Objectives

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

1. Conduct pharmacological experiments and accurately record and analyze data.

- 2. Identify and describe microorganisms that cause ocular infections.
- 3. Analyze pathological changes in ocular tissues through practical exercises.
- 4. Apply pharmacological, microbiological, and pathological knowledge to clinical scenarios in optometry.
- 5. Utilize laboratory techniques and equipment proficiently.

Topics Covered

1. Introduction to Laboratory Techniques

- Safety protocols
- Use of laboratory equipment

2. Ocular Pharmacology

- Drug-receptor interactions
- Pharmacokinetics and pharmacodynamics
- Therapeutic uses and side effects of ocular drugs

3. Ocular Microbiology

- o Identification of common ocular pathogens
- Diagnostic techniques for microbial infections
- Antimicrobial resistance and treatment strategies

4. Clinical Pathology

- Histopathological examination of ocular tissues
- Laboratory diagnosis of ocular diseases
- Case studies of common ocular pathologies

5. Integrated Clinical Applications

- o Application of pharmacological treatments in clinical scenarios
- Management of ocular infections
- o Interpretation of pathological findings in patient care

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Ocular Pharmacology by Jimmy D. Bartlett and Siret D. Jaanus
- 2. Medical Microbiology by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller

- 3. **Basic and Clinical Pharmacology** by Bertram Katzung, Anthony Trevor, and Susan Masters
- 4. Clinical Pathology for the Health Professions by Peggy A. Simpson
- 5. Essentials of Medical Microbiology by Apurba Sankar Sastry and Sandhya Bhat

Physiological Optics and Principle of Refraction Practical

Course Description

This course provides hands-on experience in the study of physiological optics and the principles of refraction. Students will engage in practical exercises to understand the behavior of light, optical systems, and the refractive properties of the eye. The course aims to complement theoretical knowledge with practical skills essential for clinical practice in optometry.

Learning Objectives

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

- 1. Understand and apply the fundamental principles of light and optics.
- 2. Perform and interpret various optical measurements and tests.
- 3. Analyze the optical properties of the eye and visual system.
- 4. Utilize optical instruments and techniques in clinical settings.
- 5. Solve complex problems related to physiological optics and refraction.

Topics Covered

- 1. Introduction to Optical Laboratory Techniques
 - Safety protocols
 - Use of laboratory equipment

2. Geometrical Optics

- Reflection and refraction
- Snell's law
- Optical interfaces and surfaces

3. Optical Systems

- Lenses and mirrors
- Optical instruments (microscopes, telescopes)
- Magnification and image formation

4. Physiological Optics

- Optical properties of the eye
- Visual acuity and resolution

• Accommodation and convergence

5. Principles of Refraction

- Refractive errors (myopia, hyperopia, astigmatism)
- Corrective lenses and contact lenses
- Refractive surgery

6. Clinical Applications

- Diagnostic techniques (retinoscopy, keratometry)
- Optical coherence tomography (OCT)
- Case studies in refraction and optics

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Optics by Troy E. Fannin and Theodore Grosvenor
- 2. Optics for Clinicians by David G. Hunter and Constance E. West
- 3. Geometrical and Visual Optics: A Clinical Introduction by Steven H. Schwartz
- 4. Principles of Optics by Max Born and Emil Wolf
- 5. Clinical Procedures in Primary Eye Care by David B. Elliott

Ophthalmic Instruments Practical

Course Description

This course provides hands-on experience with the various instruments used in the field of optometry. Students will learn about the design, function, and application of ophthalmic instruments in clinical practice. The course aims to equip students with the knowledge and skills necessary to operate and maintain these instruments, ensuring accurate diagnosis and effective patient care.

Learning Objectives

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

- 1. Identify and describe the function of key ophthalmic instruments.
- 2. Understand the principles behind the operation of these instruments.
- 3. Demonstrate proficiency in using ophthalmic instruments for diagnostic and therapeutic purposes.

- 4. Maintain and troubleshoot common issues with ophthalmic instruments.
- 5. Apply knowledge of ophthalmic instruments to clinical scenarios in optometry.

Topics Covered

- 1. Introduction to Ophthalmic Instruments
 - Overview of common ophthalmic instruments
 - Safety protocols and handling

2. Diagnostic Instruments

- Slit lamp biomicroscope
- Keratometer
- Tonometer
- Retinoscope
- Ophthalmoscope

3. Imaging Instruments

- Fundus camera
- Optical coherence tomography (OCT)
- Ultrasound biomicroscopy
- Corneal topography

4. Refractive Instruments

- Phoropter
- o Autorefractor
- Lensometer

5. Therapeutic Instruments

- Laser systems (e.g., YAG laser)
- Cryotherapy instruments
- Electrocautery devices

6. Maintenance and Troubleshooting

- Routine maintenance procedures
- Common troubleshooting techniques
- Calibration and quality control

7. Clinical Applications

- Case studies involving the use of ophthalmic instruments
- o Integration of diagnostic data into patient management

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. Ophthalmic Instruments and Diagnostic Procedures by Michael W. Risco
- 3. **Atlas of Clinical Ophthalmology** by David J. Spalton, Roger A. Hitchings, and Paul Hunter
- 4. **Ophthalmic Clinical Procedures: A Multimedia Guide** by Janice K. Ledford and Valerie M. Sanders
- 5. The Slit Lamp Primer by Janice K. Ledford

Clinical Posting (Orientation)

Course Description

This course provides an introductory clinical experience for students in the Bachelor of Science in Optometry program. Students will be oriented to the clinical environment, including the roles and responsibilities of optometrists, patient interaction, and the use of clinical equipment. The course aims to prepare students for subsequent clinical postings by familiarizing them with clinical protocols, patient care procedures, and professional conduct.

Learning Objectives

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

- 1. Understand the roles and responsibilities of optometrists in a clinical setting.
- 2. Demonstrate effective communication skills with patients and healthcare professionals.
- 3. Apply clinical protocols and procedures in patient care.
- 4. Utilize clinical equipment and instruments proficiently.
- 5. Exhibit professional conduct and ethical behavior in a clinical environment.

Topics Covered

- 1. Introduction to Clinical Environment
 - Overview of clinical settings
 - o Roles and responsibilities of optometrists
- 2. Patient Interaction and Communication
 - Effective communication techniques

- Building rapport with patients
- Patient history taking

3. Clinical Protocols and Procedures

- Standard operating procedures
- Infection control and hygiene practices
- Patient examination techniques

4. Clinical Equipment and Instruments

- Introduction to clinical instruments
- Proper use and maintenance of equipment
- Troubleshooting common issues

5. **Professional Conduct and Ethics**

- Ethical principles in optometry
- Professional behavior and attire
- Confidentiality and patient privacy

6. Case Studies and Practical Applications

- Real-world scenarios and case studies
- Application of clinical knowledge in practice
- Reflective practice and feedback

Assessment

- Clinical Observations
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. **Optometry: Science, Techniques and Clinical Management** by Mark Rosenfield and Nicola Logan
- 3. Clinical Optometry by Andrew Keirl and Caroline Christie
- 4. Professionalism in Health Care: A Primer for Career Success by Sherry Makely
- 5. Medical Ethics: A Very Short Introduction by Tony Hope

Clinical Ophthalmology

Course Description

This course provides an in-depth study of the clinical aspects of ophthalmology, focusing on the diagnosis, treatment, and management of ocular diseases. Students will learn about various ocular conditions, their pathophysiology, and the clinical techniques used in their management. The course aims to equip students with the knowledge and skills necessary for effective clinical practice in optometry.

Learning Objectives

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

- 1. Identify and describe common ocular diseases and their pathophysiology.
- 2. Perform clinical examinations and diagnostic procedures for ocular conditions.
- 3. Develop treatment and management plans for patients with ocular diseases.
- 4. Apply clinical knowledge to real-world scenarios in optometry.
- 5. Demonstrate proficiency in using ophthalmic instruments and techniques.

Topics Covered

1. Introduction to Clinical Ophthalmology

- Overview of ocular diseases
- Role of the optometrist in clinical ophthalmology

2. Anterior Segment Diseases

- Conjunctivitis, keratitis, and uveitis
- Cataracts and corneal dystrophies
- o Diagnostic techniques and management

3. Posterior Segment Diseases

- o Retinal detachment, diabetic retinopathy, and macular degeneration
- Optic neuropathies and retinal vascular diseases
- Diagnostic techniques and management

4. Glaucoma

- Types of glaucoma and their pathophysiology
- o Diagnostic techniques (e.g., tonometry, visual field testing)
- Treatment and management strategies

5. Ocular Trauma

- Types of ocular injuries
- Emergency management and treatment
- Long-term care and rehabilitation

6. Pediatric Ophthalmology

• Common pediatric ocular conditions

- Diagnostic techniques and management
- Vision screening and early intervention

7. Systemic Diseases and the Eye

- Ocular manifestations of systemic diseases (e.g., diabetes, hypertension)
- o Interdisciplinary care and management

Assessment

- Written Exams
- Practical Exams
- Case Study Presentations
- Participation and Attendance

Recommended Reading

- 1. Clinical Ophthalmology: A Systematic Approach by Jack J. Kanski and Brad Bowling
- 2. Ophthalmology by Myron Yanoff and Jay S. Duker
- 3. The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease by Adam T. Gerstenblith and Peter J. Garg
- 4. Basic and Clinical Science Course (BCSC) Complete Set by the American Academy of Ophthalmology
- 5. Clinical Procedures in Primary Eye Care by David B. Elliott

Clinical Refraction and Binocular Vision

Course Description

This course provides an in-depth study of the principles and clinical techniques involved in refraction and binocular vision. Students will learn about the assessment and management of refractive errors and binocular vision disorders. The course aims to equip students with the knowledge and skills necessary to diagnose and treat these conditions effectively in clinical practice.

Learning Objectives

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

- 1. Understand the principles of refraction and binocular vision.
- 2. Perform comprehensive refraction assessments.
- 3. Diagnose and manage common refractive errors and binocular vision disorders.
- 4. Apply clinical techniques to assess and treat binocular vision anomalies.
- 5. Integrate knowledge of refraction and binocular vision into patient care.

Topics Covered

1. Introduction to Refraction

- Principles of light and optics
- Refractive errors (myopia, hyperopia, astigmatism, presbyopia)
- Corrective lenses and contact lenses

2. Clinical Refraction Techniques

- Subjective and objective refraction
- Retinoscopy and autorefractors
- Phoropter use and lensometry

3. Binocular Vision

- Anatomy and physiology of binocular vision
- Sensory and motor fusion
- Stereopsis and depth perception

4. Assessment of Binocular Vision

- Cover test and Maddox rod
- Prism bar and synoptophore
- Assessment of vergence and accommodation

5. Management of Binocular Vision Disorders

- Strabismus and amblyopia
- Convergence insufficiency and excess
- Vision therapy and orthoptics

6. Clinical Applications

- Case studies in refraction and binocular vision
- Integration of diagnostic data into patient management
- Interprofessional collaboration in patient care

Assessment

- Written Exams
- Practical Exams
- Case Study Presentations
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. Optics, Retinoscopy, and Refractometry by David B. Elliott
- 3. **Binocular Vision and Ocular Motility: Theory and Management of Strabismus** by Gunter K. von Noorden and Emilio C. Campos
- 4. Clinical Management of Binocular Vision: Heterophoric, Accommodative, and Eye Movement Disorders by Mitchell Scheiman and Bruce Wick
- 5. Foundations of Binocular Vision: A Clinical Perspective by Bruce J. W. Evans

Low Vision and Optical Dispensing

Course Description

This course provides an in-depth study of low vision and the principles of optical dispensing. Students will learn about the assessment and management of low vision, as well as the design, fitting, and dispensing of optical aids. The course aims to equip students with the knowledge and skills necessary to improve the visual function and quality of life for patients with low vision.

Learning Objectives

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

- 1. Understand the causes and implications of low vision.
- 2. Perform comprehensive low vision assessments.
- 3. Design and dispense appropriate optical aids for patients with low vision.
- 4. Apply principles of optical dispensing in clinical practice.
- 5. Provide patient education and support for the use of low vision aids.

Topics Covered

1. Introduction to Low Vision

- Definition and classification of low vision
- Epidemiology and causes of low vision
- Impact of low vision on daily life

2. Assessment of Low Vision

- Visual acuity and contrast sensitivity testing
- Functional vision assessment
- Use of low vision assessment tools

3. Management of Low Vision

- Optical aids (magnifiers, telescopes, electronic devices)
- Non-optical aids (lighting, contrast enhancement)
- Rehabilitation strategies and services

4. Principles of Optical Dispensing

- Lens materials and designs
- Frame selection and fitting
- Prescription analysis and verification

5. Dispensing Techniques

- Measurement and fitting of spectacles
- Adjustments and repairs
- Patient education and follow-up

6. Clinical Applications

- Case studies in low vision and optical dispensing
- Integration of low vision aids into patient care
- Interprofessional collaboration in low vision management

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Low Vision Rehabilitation: A Practical Guide for Occupational Therapists by Mitchell Scheiman and Maxine Scheiman
- 2. Clinical Low Vision by Eleanor E. Faye
- 3. **Optical Dispensing** by Anthony J. Phillips and Lynne Speedwell
- 4. Foundations of Low Vision: Clinical and Functional Perspectives by Anne L. Corn and Jane N. Erin
- 5. Clinical Procedures in Primary Eye Care by David B. Elliott

Community Ophthalmology and Eye Bank

Course Description

This course provides an in-depth understanding of community ophthalmology and the role of eye banks in public health. Students will learn about the prevention and management of blindness, the principles of community eye care, and the operations of eye banks. The course aims to equip students with the knowledge and skills necessary to contribute to community eye health initiatives and the management of eye banks.

Learning Objectives

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

- 1. Understand the principles and practices of community ophthalmology.
- 2. Identify and address the major causes of blindness and visual impairment in communities.
- 3. Develop and implement community eye health programs.
- 4. Understand the role and operations of eye banks.
- 5. Apply knowledge of community ophthalmology and eye banking to improve public eye health.

Topics Covered

- 1. Introduction to Community Ophthalmology
 - o Definition and scope
 - Importance of community eye health
- 2. Epidemiology of Blindness and Visual Impairment
 - Global and regional statistics
 - Major causes of blindness and visual impairment

3. Prevention and Management of Blindness

- Strategies for prevention
- Screening and early detection programs
- Treatment and rehabilitation services

4. Community Eye Health Programs

- Planning and implementation
- Monitoring and evaluation
- Case studies of successful programs

5. Eye Banks

- Role and importance of eye banks
- Eye donation and transplantation
- Operational procedures and quality control

6. Public Health and Policy

- Health education and promotion
- Advocacy for eye health
- Policy development and implementation

Assessment

- Written Exams
- Project Reports

- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Community Eye Health: A Manual by Sheila K. West and Hugh R. Taylor
- 2. **Epidemiology of Eye Disease** by Gordon J. Johnson, Darwin C. Minassian, Robert Weale, and Sheila K. West
- 3. **Eye Banking: A Guide for Eye Bank Professionals** by Mark J. Mannis and Edward J. Holland
- 4. Public Health Ophthalmology by Tanuj Dada and Pradeep Sharma
- 5. **Principles and Practice of Community Ophthalmology** by S. K. Gupta and R. P. Gupta

Human Immunology and Infections and Diseases

Course Description

This course provides an in-depth study of the human immune system and the various infectious diseases that affect it. Students will explore the mechanisms of immune responses, the pathology of infectious diseases, and the interaction between pathogens and the immune system. The course aims to equip students with the knowledge and skills necessary to understand and manage infections and immune-related conditions in clinical practice.

Learning Objectives

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

- 1. Understand the structure and function of the human immune system.
- 2. Identify and describe the major types of pathogens and the diseases they cause.
- 3. Analyze the mechanisms of immune responses to infections.
- 4. Apply knowledge of immunology and infectious diseases to clinical scenarios in optometry.
- 5. Utilize laboratory techniques to diagnose and manage infections and immune-related conditions.

Topics Covered

- 1. Introduction to Immunology
 - Overview of the immune system
 - Innate and adaptive immunity
 - Cells and organs of the immune system

2. Immune Responses

- Antigen recognition and presentation
- Humoral and cell-mediated immunity
- Immunological memory and tolerance

3. Pathogens and Infectious Diseases

- Bacteria, viruses, fungi, and parasites
- Pathogenesis and transmission of infectious diseases
- Clinical manifestations and diagnosis

4. Host-Pathogen Interactions

- Mechanisms of pathogen evasion
- Immune responses to different types of pathogens
- o Immunopathology

5. Vaccines and Immunization

- Principles of vaccination
- Types of vaccines and their mechanisms
- Immunization programs and public health

6. Clinical Immunology

- Autoimmune diseases
- Hypersensitivity reactions
- o Immunodeficiencies

7. Laboratory Techniques in Immunology and Microbiology

- Diagnostic tests for infectious diseases
- Immunoassays and molecular techniques
- Case studies and practical applications

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Janeway's Immunobiology by Kenneth Murphy and Casey Weaver
- 2. Medical Microbiology by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller

- 3. Immunology: A Short Course by Richard Coico and Geoffrey Sunshine
- 4. Clinical Immunology: Principles and Practice by Robert R. Rich
- 5. Infectious Diseases: A Clinical Short Course by Frederick S. Southwick

Clinical Ophthalmology Practical

Course Description

This course provides hands-on experience in the clinical aspects of ophthalmology, focusing on the diagnosis, treatment, and management of ocular diseases. Students will engage in practical exercises to develop their clinical skills and apply theoretical knowledge in real-world scenarios. The course aims to prepare students for effective clinical practice in optometry by enhancing their proficiency in using ophthalmic instruments and techniques.

Learning Objectives

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

- 1. Perform comprehensive clinical examinations of the eye.
- 2. Diagnose and manage common ocular diseases.
- 3. Utilize ophthalmic instruments and techniques proficiently.
- 4. Apply clinical knowledge to patient care scenarios.
- 5. Demonstrate professional and ethical behavior in a clinical setting.

Topics Covered

1. Introduction to Clinical Ophthalmology

- Overview of ocular diseases
- Role of the optometrist in clinical ophthalmology

2. Anterior Segment Examination

- Slit lamp biomicroscopy
- Corneal and conjunctival assessment
- o Anterior chamber and iris examination

3. Posterior Segment Examination

- Fundus examination using direct and indirect ophthalmoscopy
- Retinal imaging techniques (e.g., OCT, fundus photography)
- Assessment of the optic nerve and macula

4. Glaucoma Assessment

- Tonometry and intraocular pressure measurement
- Visual field testing
- Gonioscopy

5. Ocular Surface and Tear Film Evaluation

- Tear film assessment techniques
- Diagnosis and management of dry eye disease
- Staining techniques (e.g., fluorescein, lissamine green)

6. Pediatric Ophthalmology

- Examination techniques for children
- Common pediatric ocular conditions
- Vision screening and early intervention

7. Emergency Ophthalmology

- Management of ocular trauma
- o Diagnosis and treatment of acute ocular conditions
- Triage and referral protocols

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. Clinical Ophthalmology: A Systematic Approach by Jack J. Kanski and Brad Bowling
- 3. The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease by Adam T. Gerstenblith and Peter J. Garg
- 4. **Ophthalmic Clinical Procedures: A Multimedia Guide** by Janice K. Ledford and Valerie M. Sanders
- 5. **Atlas of Clinical Ophthalmology** by David J. Spalton, Roger A. Hitchings, and Paul Hunter

Clinical Refraction and Binocular Vision Practical

Course Description

This course provides hands-on experience in the clinical assessment and management of refractive errors and binocular vision disorders. Students will engage in practical exercises to develop their skills in refraction techniques and binocular vision assessment. The course aims to prepare students for effective clinical practice by enhancing their proficiency in using diagnostic tools and techniques.

Learning Objectives

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

- 1. Perform comprehensive refraction assessments.
- 2. Diagnose and manage common refractive errors.
- 3. Assess and treat binocular vision disorders.
- 4. Utilize clinical instruments and techniques proficiently.
- 5. Apply clinical knowledge to patient care scenarios.

Topics Covered

1. Introduction to Clinical Refraction

- Overview of refractive errors
- Principles of light and optics

2. Refraction Techniques

- Subjective and objective refraction
- Retinoscopy and autorefractors
- Phoropter use and lensometry

3. Binocular Vision Assessment

- Anatomy and physiology of binocular vision
- Sensory and motor fusion
- Stereopsis and depth perception

4. Clinical Techniques for Binocular Vision

- Cover test and Maddox rod
- Prism bar and synoptophore
- Assessment of vergence and accommodation

5. Management of Binocular Vision Disorders

- o Strabismus and amblyopia
- Convergence insufficiency and excess
- Vision therapy and orthoptics

6. Clinical Applications

- Case studies in refraction and binocular vision
- o Integration of diagnostic data into patient management
- Interprofessional collaboration in patient care

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. Optics, Retinoscopy, and Refractometry by David B. Elliott
- 3. **Binocular Vision and Ocular Motility: Theory and Management of Strabismus** by Gunter K. von Noorden and Emilio C. Campos
- 4. Clinical Management of Binocular Vision: Heterophoric, Accommodative, and Eye Movement Disorders by Mitchell Scheiman and Bruce Wick
- 5. Foundations of Binocular Vision: A Clinical Perspective by Bruce J. W. Evans

Low Vision and Optical Dispensing Practical

Course Description

This course provides hands-on experience in the assessment and management of low vision, as well as the principles and techniques of optical dispensing. Students will engage in practical exercises to develop their skills in fitting and dispensing optical aids, and in providing comprehensive care for patients with low vision. The course aims to enhance students' practical skills and their ability to apply theoretical knowledge in clinical settings.

Learning Objectives

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

- 1. Perform comprehensive low vision assessments.
- 2. Design and dispense appropriate optical aids for patients with low vision.
- 3. Apply principles of optical dispensing in clinical practice.
- 4. Provide patient education and support for the use of low vision aids.
- 5. Utilize practical skills to improve the visual function and quality of life for patients with low vision.

Topics Covered

1. Introduction to Low Vision

- o Definition and classification of low vision
- Impact of low vision on daily life

2. Assessment of Low Vision

• Visual acuity and contrast sensitivity testing

- Functional vision assessment
- Use of low vision assessment tools

3. Management of Low Vision

- Optical aids (magnifiers, telescopes, electronic devices)
- Non-optical aids (lighting, contrast enhancement)
- Rehabilitation strategies and services

4. Principles of Optical Dispensing

- Lens materials and designs
- Frame selection and fitting
- Prescription analysis and verification

5. Dispensing Techniques

- Measurement and fitting of spectacles
- o Adjustments and repairs
- Patient education and follow-up

6. Clinical Applications

- Case studies in low vision and optical dispensing
- Integration of low vision aids into patient care
- Interprofessional collaboration in low vision management

Assessment

- Lab Reports
- Practical Exams
- Quizzes
- Participation and Attendance

Recommended Reading

- 1. Low Vision Rehabilitation: A Practical Guide for Occupational Therapists by Mitchell Scheiman and Maxine Scheiman
- 2. Clinical Low Vision by Eleanor E. Faye
- 3. **Optical Dispensing** by Anthony J. Phillips and Lynne Speedwell
- 4. Foundations of Low Vision: Clinical and Functional Perspectives by Anne L. Corn and Jane N. Erin
- 5. Clinical Procedures in Primary Eye Care by David B. Elliott

Internship I

Course Description

This course provides students with their first practical experience in a clinical setting, allowing them to apply theoretical knowledge and develop essential clinical skills under the supervision of experienced optometrists. The internship aims to enhance students' understanding of professional practice, patient care, and the operational aspects of an optometry clinic.

Learning Objectives

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

- 1. Apply theoretical knowledge to real-world clinical scenarios.
- 2. Develop and refine clinical skills in patient examination and diagnosis.
- 3. Demonstrate effective communication with patients and healthcare professionals.
- 4. Understand the workflow and management of an optometry clinic.
- 5. Exhibit professional behavior and ethical conduct in a clinical setting.

Topics Covered

1. Clinical Orientation

- o Introduction to the clinical environment
- Roles and responsibilities of an intern

2. Patient Examination Techniques

- Comprehensive eye examinations
- Visual acuity testing
- Refraction and binocular vision assessment

3. Diagnostic Procedures

- Use of diagnostic instruments (e.g., slit lamp, ophthalmoscope)
- Imaging techniques (e.g., OCT, fundus photography)
- Interpretation of diagnostic results

4. Patient Management

- Developing treatment plans
- Patient education and counseling
- Follow-up care and management

5. Professional Communication

- Effective communication with patients
- Interprofessional collaboration
- Documentation and record-keeping
- 6. Clinical Workflow and Management

- Appointment scheduling and patient flow
- o Inventory management and equipment maintenance
- o Understanding billing and insurance processes

Assessment

- Clinical Performance Evaluations
- Case Study Presentations
- Reflective Journals
- Participation and Attendance

Recommended Reading

- 1. Clinical Procedures in Primary Eye Care by David B. Elliott
- 2. **Optometry: Science, Techniques and Clinical Management** by Mark Rosenfield and Nicola Logan
- 3. Clinical Optometry by Andrew Keirl and Caroline Christie
- 4. Professionalism in Health Care: A Primer for Career Success by Sherry Makely
- 5. Medical Ethics: A Very Short Introduction by Tony Hope

Knowledge of Health and Illness for Optometrists I

Course Description

This course provides an introduction to the fundamental concepts of health and illness, with a specific focus on their relevance to optometry. Students will explore the physiological, pathological, and psychological aspects of health and disease, and how these impact ocular health. The course aims to equip students with the knowledge necessary to understand common systemic diseases and their ocular manifestations.

Learning Objectives

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

- 1. Understand the basic principles of health and illness.
- 2. Identify common systemic diseases and their impact on ocular health.
- 3. Explain the pathophysiology of common diseases affecting the eye.
- 4. Apply knowledge of health and illness to clinical optometry practice.
- 5. Develop a holistic approach to patient care, considering both ocular and systemic health.

Topics Covered

- 1. Introduction to Health and Illness
 - o Definitions and concepts

- Determinants of health
- Health promotion and disease prevention

2. Human Anatomy and Physiology

- Overview of body systems
- Homeostasis and regulatory mechanisms

3. Pathophysiology of Common Diseases

- Cardiovascular diseases
- Diabetes mellitus
- Respiratory diseases
- Infectious diseases

4. Ocular Manifestations of Systemic Diseases

- Diabetic retinopathy
- Hypertensive retinopathy
- Thyroid eye disease
- Autoimmune diseases and the eye

5. Psychological Aspects of Health and Illness

- Impact of chronic illness on mental health
- Patient communication and empathy

6. Clinical Applications in Optometry

- Case studies and clinical scenarios
- o Integrating systemic health into optometric practice

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Medicine" by Kumar and Clark
- 2. "Pathophysiology of Disease: An Introduction to Clinical Medicine" by McPhee and Hammer
- 3. "Ocular Disease: Mechanisms and Management" by Bruce Muchnick
- 4. "Systemic Disease and the Eye" by Jack J. Kanski

Legal and Ethical Aspects of Health Care

Course Description

This course explores the legal and ethical principles that underpin healthcare practice, with a focus on their application in optometry. Students will examine the legal responsibilities and ethical dilemmas faced by healthcare professionals, including issues related to patient rights, confidentiality, informed consent, and professional conduct. The course aims to develop students' ability to navigate complex legal and ethical situations in their future practice.

Learning Objectives

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

- 1. Understand the fundamental legal and ethical principles in healthcare.
- 2. Identify and analyze legal issues relevant to optometric practice.
- 3. Apply ethical theories and principles to real-world healthcare scenarios.
- 4. Evaluate the impact of legal and ethical decisions on patient care and professional practice.
- 5. Develop strategies for ethical decision-making and professional conduct.

Topics Covered

- 1. Introduction to Healthcare Law and Ethics
 - Definitions and key concepts
 - Historical development of healthcare law and ethics

2. Legal Framework in Healthcare

- Overview of the legal system
- Healthcare regulations and policies
- o Professional liability and malpractice

3. Patient Rights and Confidentiality

- Informed consent
- Patient confidentiality and privacy laws
- Handling sensitive patient information

4. Ethical Theories and Principles

- Autonomy, beneficence, non-maleficence, and justice
- o Ethical decision-making models
- Case studies in ethical dilemmas

5. Professional Conduct and Responsibilities

- Codes of ethics and professional guidelines
- Conflict of interest and professional boundaries

• Reporting unethical behavior

6. Legal and Ethical Issues in Optometry

- Specific legal cases and ethical issues in optometric practice
- Managing patient complaints and disputes
- Ethical considerations in clinical research

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Medical Law and Ethics" by Jonathan Herring
- 2. "Principles of Biomedical Ethics" by Tom L. Beauchamp and James F. Childress
- 3. "Legal Aspects of Optometry" by A. Edward Bennett and Barry A. Weissman
- 4. "Ethics in Health Administration: A Practical Approach for Decision Makers" by Eileen E. Morrison

Human Molecular Genetics

Course Description

This course provides an in-depth understanding of the molecular basis of genetics and its implications for human health, with a particular focus on ocular genetics. Students will explore the structure and function of genes, genetic variation, and the molecular mechanisms underlying genetic diseases. The course aims to equip students with the knowledge necessary to understand genetic contributions to ocular conditions and to apply this knowledge in clinical practice.

Learning Objectives

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

- 1. Understand the fundamental principles of molecular genetics.
- 2. Describe the structure and function of DNA, RNA, and proteins.
- 3. Explain the mechanisms of genetic inheritance and variation.
- 4. Identify the molecular basis of common genetic diseases.
- 5. Apply genetic knowledge to the diagnosis and management of ocular conditions.

Topics Covered

1. Introduction to Molecular Genetics

- o Overview of molecular genetics
- Historical perspectives and key discoveries

2. DNA Structure and Function

- DNA replication, transcription, and translation
- Genetic code and protein synthesis

3. Genetic Inheritance and Variation

- Mendelian genetics
- Non-Mendelian inheritance patterns
- Genetic mutations and polymorphisms

4. Molecular Basis of Genetic Diseases

- Mechanisms of genetic disorders
- Examples of single-gene and multifactorial diseases
- Genetic testing and counseling

5. Ocular Genetics

- Genetic basis of common ocular diseases (e.g., retinitis pigmentosa, glaucoma)
- Genetic screening and diagnosis in optometry
- Emerging therapies and gene editing technologies

6. Genomics and Personalized Medicine

- Advances in genomics and their applications
- Ethical, legal, and social implications of genetic research

Assessment

- Midterm Exam
- Assignments
- Laboratory Reports
- Final Exam

Recommended Reading

- 1. "Human Molecular Genetics" by Tom Strachan and Andrew Read
- 2. "Genetics: From Genes to Genomes" by Leland Hartwell et al.
- 3. "Principles of Genetics" by D. Peter Snustad and Michael J. Simmons
- 4. "Ocular Genetics: Clinical and Experimental Research" by Graeme C.M. Black and Mark J. Trembath

Diseases of the Eye

Course Description

This course provides a comprehensive overview of the various diseases affecting the eye, including their pathophysiology, clinical presentation, and management. Students will learn to identify and differentiate between common and rare ocular diseases, understand their underlying mechanisms, and apply this knowledge to clinical practice. The course aims to prepare students for diagnosing and managing ocular diseases in a clinical setting.

Learning Objectives

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

- 1. Understand the pathophysiology of common and rare ocular diseases.
- 2. Identify the clinical signs and symptoms of various eye diseases.
- 3. Perform differential diagnosis of ocular conditions.
- 4. Develop appropriate management and treatment plans for patients with ocular diseases.
- 5. Integrate knowledge of ocular diseases into comprehensive patient care.

Topics Covered

1. Introduction to Ocular Diseases

- Overview of ocular anatomy and physiology
- Basic concepts in ocular pathology

2. Infectious Diseases of the Eye

- Bacterial, viral, fungal, and parasitic infections
- o Conjunctivitis, keratitis, endophthalmitis

3. Inflammatory and Autoimmune Diseases

- o Uveitis, scleritis, episcleritis
- Autoimmune conditions affecting the eye

4. Degenerative and Age-Related Diseases

- Cataracts, age-related macular degeneration (AMD)
- Glaucoma, diabetic retinopathy

5. Genetic and Congenital Eye Diseases

- Retinitis pigmentosa, congenital cataracts
- Genetic syndromes with ocular manifestations

6. Trauma and Injury to the Eye

- Ocular trauma, chemical injuries
- Management of acute eye injuries

7. Neoplastic Diseases of the Eye

- Benign and malignant tumors
- Retinoblastoma, ocular melanoma

8. Systemic Diseases with Ocular Manifestations

- Hypertensive retinopathy, thyroid eye disease
- Systemic infections and their ocular impact

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Clinical Ophthalmology: A Systematic Approach" by Jack J. Kanski and Brad Bowling
- 2. "Ocular Pathology" by Myron Yanoff and Joseph W. Sassani
- 3. "The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease" by Adam T. Gerstenblith and Michael P. Rabinowitz
- 4. "Basic and Clinical Science Course (BCSC) Series" by the American Academy of Ophthalmology

Clinical Skills for Optometrists I

Course Description

This course introduces students to the essential clinical skills required for optometric practice. Emphasis is placed on developing proficiency in patient examination techniques, diagnostic procedures, and the use of clinical equipment. Students will gain hands-on experience through practical sessions and simulations, preparing them for real-world clinical settings.

Learning Objectives

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

- 1. Perform comprehensive eye examinations.
- 2. Utilize clinical equipment effectively and safely.
- 3. Conduct diagnostic tests and interpret results.
- 4. Develop patient communication and history-taking skills.
- 5. Apply clinical skills in a simulated environment.

Topics Covered

1. Introduction to Clinical Skills

- Overview of clinical practice in optometry
- o Importance of clinical skills in patient care

2. Patient History and Communication

- Techniques for effective patient communication
- Taking comprehensive patient histories

3. Basic Eye Examination Techniques

- Visual acuity testing
- Refraction and retinoscopy
- Slit lamp examination

4. Diagnostic Procedures

- o Tonometry and intraocular pressure measurement
- Fundus examination and ophthalmoscopy
- Visual field testing

5. Use of Clinical Equipment

- Proper handling and maintenance of clinical instruments
- Calibration and troubleshooting of equipment

6. Clinical Simulations and Practical Sessions

- Hands-on practice with clinical skills
- Simulated patient scenarios and case studies

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Principles of Pharmacology and Toxicology

Course Description

This course provides an introduction to the fundamental principles of pharmacology and toxicology, focusing on the mechanisms of drug action, pharmacokinetics, and pharmacodynamics. Students will explore the effects of drugs and toxicants on biological systems, the processes of drug absorption, distribution, metabolism, and excretion, and the principles of toxicology. The course aims to equip students with the knowledge necessary to understand the safe and effective use of drugs in clinical practice.

Learning Objectives

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

- 1. Understand the basic principles of pharmacology and toxicology.
- 2. Describe the processes of drug absorption, distribution, metabolism, and excretion.
- 3. Explain the mechanisms of drug action and the concept of dose-response relationships.
- 4. Identify the toxicological effects of various substances on biological systems.
- 5. Apply pharmacological and toxicological principles to clinical scenarios.

Topics Covered

1. Introduction to Pharmacology and Toxicology

- o Definitions and key concepts
- Historical perspectives

2. Pharmacokinetics

- Absorption, distribution, metabolism, and excretion (ADME)
- Factors affecting drug pharmacokinetics

3. Pharmacodynamics

- Mechanisms of drug action
- Receptor theory and signal transduction
- Dose-response relationships

4. Toxicology

- Principles of toxicology
- Types of toxicants and their effects
- Toxicokinetics and toxicodynamics

5. Drug Metabolism and Biotransformation

- Enzymatic pathways of drug metabolism
- Factors influencing drug metabolism

6. Adverse Drug Reactions and Drug Interactions

- Types and mechanisms of adverse drug reactions
- Clinical significance of drug interactions

7. Clinical Applications of Pharmacology and Toxicology

- Case studies and clinical scenarios
- Therapeutic drug monitoring

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Rang & Dale's Pharmacology" by James M. Ritter, Rod Flower, Graeme Henderson, and Yoon Kong Loke
- 2. "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence Brunton, Bjorn Knollmann, and Randa Hilal-Dandan
- 3. "Casarett & Doull's Essentials of Toxicology" by Curtis D. Klaassen and John B. Watkins III
- 4. "Basic and Clinical Pharmacology" by Bertram Katzung

Pathophysiology for Medical Science

Course Description

This course provides an in-depth understanding of the physiological processes and mechanisms underlying human diseases. Students will explore the alterations in normal physiological functions that lead to various pathological conditions, with a focus on diseases affecting the eye and visual system. The course aims to equip students with the knowledge necessary to understand the pathophysiology of diseases and apply this understanding in clinical optometry practice.

Learning Objectives

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

- 1. Understand the basic principles of pathophysiology.
- 2. Describe the mechanisms of cell injury and adaptation.
- 3. Explain the pathophysiological processes of inflammation and repair.
- 4. Identify the pathophysiology of common diseases affecting major organ systems.

5. Apply pathophysiological concepts to the diagnosis and management of ocular diseases.

Topics Covered

- 1. Introduction to Pathophysiology
 - Definitions and key concepts
 - Homeostasis and disease

2. Cell Injury and Adaptation

- Mechanisms of cell injury
- Cellular adaptations to stress
- Apoptosis and necrosis

3. Inflammation and Repair

- Acute and chronic inflammation
- Tissue repair and wound healing

4. Pathophysiology of Major Organ Systems

- Cardiovascular system: hypertension, atherosclerosis
- Respiratory system: asthma, chronic obstructive pulmonary disease (COPD)
- o Renal system: acute kidney injury, chronic kidney disease
- o Nervous system: stroke, neurodegenerative diseases

5. Pathophysiology of Ocular Diseases

- Glaucoma, cataracts, age-related macular degeneration (AMD)
- Diabetic retinopathy, hypertensive retinopathy
- Infectious and inflammatory eye diseases

6. Genetic and Congenital Disorders

- Genetic mutations and inherited diseases
- o Congenital anomalies affecting the eye

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

1. "Robbins & Cotran Pathologic Basis of Disease" by Vinay Kumar, Abul K. Abbas, and Jon C. Aster

- 2. "Pathophysiology: The Biologic Basis for Disease in Adults and Children" by Kathryn L. McCance and Sue E. Huether
- 3. "Essentials of Pathophysiology: Concepts of Altered Health States" by Carol Porth
- 4. "Clinical Pathophysiology Made Ridiculously Simple" by Aaron Berkowitz

Ocular Anatomy and Histology

Course Description

This course provides a comprehensive study of the anatomical and histological structures of the eye and its associated systems. Students will explore the detailed anatomy of ocular tissues, including their microscopic structure and function. The course aims to equip students with the foundational knowledge necessary to understand the normal and pathological conditions of the eye.

Learning Objectives

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

- 1. Describe the gross and microscopic anatomy of the eye.
- 2. Identify the histological features of ocular tissues.
- 3. Understand the functional significance of different ocular structures.
- 4. Relate anatomical and histological knowledge to clinical practice.
- 5. Recognize the histopathological changes associated with common ocular diseases.

Topics Covered

1. Introduction to Ocular Anatomy and Histology

- o Overview of ocular anatomy
- Basic histological techniques and staining methods

2. External Structures of the Eye

- Eyelids, conjunctiva, and lacrimal apparatus
- Histology of the eyelid and conjunctiva

3. Anterior Segment of the Eye

- Cornea, sclera, and limbus
- Anterior chamber and aqueous humor dynamics
- Histology of the cornea and sclera

4. Lens and Ciliary Body

- Anatomy and function of the lens
- Ciliary body structure and aqueous humor production

• Histology of the lens and ciliary body

5. Uveal Tract

- Iris, ciliary body, and choroid
- Blood supply and innervation
- Histology of the uveal tract

6. Posterior Segment of the Eye

- Retina, optic nerve, and vitreous body
- Retinal layers and photoreceptor cells
- Histology of the retina and optic nerve

7. Ocular Blood Supply and Innervation

- Vascular supply to the eye
- Cranial nerves involved in ocular function
- Histology of ocular blood vessels and nerves

8. Histopathology of Ocular Diseases

- Common histopathological changes in ocular diseases
- o Diagnostic techniques in ocular histopathology

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Anatomy of the Eye" by Richard S. Snell and Michael A. Lemp
- 2. "Adler's Physiology of the Eye" by Leonard A. Levin, Siv F. E. Nilsson, and Samuel Wu
- 3. "Ocular Anatomy and Histology" by Myron Yanoff and Joseph W. Sassani
- 4. "Basic and Clinical Science Course (BCSC) Series" by the American Academy of Ophthalmology

Knowledge of Health and Illness for Optometrists II

Course Description

This course builds on the foundational concepts introduced in Knowledge of Health and Illness for Optometrists I, delving deeper into the complex interactions between systemic health and ocular conditions. Students will explore advanced topics in pathophysiology, the impact of

chronic diseases on eye health, and the integration of systemic health management in optometric practice. The course aims to enhance students' ability to provide comprehensive care by understanding the broader health context of their patients.

Learning Objectives

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

- 1. Analyze the advanced pathophysiological mechanisms of systemic diseases.
- 2. Understand the impact of chronic diseases on ocular health.
- 3. Integrate systemic health considerations into optometric practice.
- 4. Develop advanced diagnostic and management strategies for patients with complex health conditions.
- 5. Apply knowledge of systemic diseases to improve patient outcomes in optometry.

Topics Covered

1. Advanced Pathophysiology

- Mechanisms of chronic diseases
- Multi-system interactions and complications

2. Chronic Diseases and Ocular Health

- Cardiovascular diseases and their ocular manifestations
- Endocrine disorders, including diabetes and thyroid diseases
- Neurological conditions and their impact on vision

3. Infectious Diseases and the Eye

- Systemic infections with ocular involvement
- Emerging infectious diseases and their ocular implications

4. Autoimmune and Inflammatory Diseases

- Pathophysiology of autoimmune diseases
- o Ocular manifestations of systemic inflammatory conditions

5. Geriatric Health and Ocular Diseases

- Age-related systemic and ocular conditions
- Comprehensive care for elderly patients

6. Integrative Health Approaches

- Holistic patient care strategies
- o Interprofessional collaboration in managing systemic and ocular health

Assessment

Midterm Exam

- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Clinical Medicine" by Kumar and Clark
- 2. "Pathophysiology of Disease: An Introduction to Clinical Medicine" by McPhee and Hammer
- 3. "Ocular Disease: Mechanisms and Management" by Bruce Muchnick
- 4. "Systemic Disease and the Eye" by Jack J. Kanski

Clinical Skills for Optometrists II

Course Description

This course builds on the foundational clinical skills introduced in Clinical Skills for Optometrists I. Students will further develop their proficiency in advanced diagnostic techniques, patient management, and clinical decision-making. Emphasis is placed on integrating theoretical knowledge with practical skills through hands-on practice and clinical simulations. The course aims to prepare students for more complex clinical scenarios and enhance their ability to provide comprehensive patient care.

Learning Objectives

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

- 1. Perform advanced diagnostic procedures and interpret clinical findings.
- 2. Manage complex patient cases with a focus on differential diagnosis.
- 3. Utilize advanced clinical equipment and technologies.
- 4. Develop effective patient management and communication strategies.
- 5. Apply clinical skills in a variety of real-world scenarios.

Topics Covered

- 1. Advanced Diagnostic Techniques
 - Optical coherence tomography (OCT)
 - Corneal topography
 - Visual field analysis

2. Patient Management and Communication

- o Managing patients with complex ocular conditions
- o Effective communication strategies for diverse patient populations
- Patient education and counseling

3. Clinical Decision-Making

- o Differential diagnosis and clinical reasoning
- Evidence-based practice in optometry
- Case studies and clinical scenarios

4. Advanced Use of Clinical Equipment

- Handling and maintenance of advanced diagnostic tools
- Calibration and troubleshooting of clinical instruments

5. Specialized Clinical Skills

- Contact lens fitting and management
- Low vision assessment and rehabilitation
- o Pediatric optometry and managing special populations

6. Clinical Simulations and Practical Sessions

- Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case studies

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Normal Eye and Vision

Course Description

This course provides a comprehensive overview of the anatomy, physiology, and function of the normal eye and visual system. Students will explore the structural and functional aspects of the eye, including visual pathways and mechanisms of vision. The course aims to equip students with a solid foundation in understanding how the eye works under normal conditions, which is essential for diagnosing and managing ocular diseases.

Learning Objectives

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

- 1. Describe the anatomy of the eye and its associated structures.
- 2. Understand the physiological processes involved in vision.
- 3. Explain the visual pathways and mechanisms of visual perception.
- 4. Identify the normal functions of different ocular structures.
- 5. Apply knowledge of normal eye anatomy and physiology to clinical practice.

Topics Covered

1. Introduction to Ocular Anatomy and Physiology

- Overview of the eye and visual system
- Basic histological techniques and staining methods

2. External Structures of the Eye

- Eyelids, conjunctiva, and lacrimal apparatus
- Anatomy and function of the cornea and sclera

3. Anterior Segment of the Eye

- o Anatomy and function of the anterior chamber
- Aqueous humor dynamics and intraocular pressure regulation

4. Lens and Ciliary Body

- Structure and function of the lens
- Accommodation and presbyopia

5. Uveal Tract

- Anatomy and function of the iris, ciliary body, and choroid
- Blood supply and innervation

6. Posterior Segment of the Eye

- Retina, optic nerve, and vitreous body
- Photoreceptor cells and visual transduction

7. Visual Pathways and Perception

- Visual pathways from the retina to the visual cortex
- Mechanisms of visual perception and processing

8. Ocular Blood Supply and Innervation

- Vascular supply to the eye
- Cranial nerves involved in ocular function

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Anatomy of the Eye" by Richard S. Snell and Michael A. Lemp
- 2. "Adler's Physiology of the Eye" by Leonard A. Levin, Siv F. E. Nilsson, and Samuel Wu
- 3. "Ocular Anatomy and Histology" by Myron Yanoff and Joseph W. Sassani
- 4. "Basic and Clinical Science Course (BCSC) Series" by the American Academy of Ophthalmology

Ocular Examination Techniques and Ocular Therapeutics

Course Description

This course provides an in-depth exploration of the techniques used in ocular examination and the therapeutic management of ocular diseases. Students will learn advanced diagnostic procedures, the use of therapeutic agents, and the principles of pharmacology relevant to optometry. The course aims to equip students with the skills and knowledge necessary to perform comprehensive ocular examinations and manage ocular conditions effectively.

Learning Objectives

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

- 1. Perform advanced ocular examination techniques.
- 2. Utilize therapeutic agents in the management of ocular diseases.
- 3. Understand the pharmacological principles relevant to ocular therapeutics.
- 4. Develop treatment plans for various ocular conditions.
- 5. Integrate diagnostic and therapeutic skills in clinical practice.

Topics Covered

- 1. Advanced Ocular Examination Techniques
 - Slit lamp biomicroscopy
 - Gonioscopy

• Fundus examination and imaging

2. Diagnostic Procedures

- Optical coherence tomography (OCT)
- Corneal topography
- Visual field testing

3. Pharmacology for Optometrists

- Principles of pharmacokinetics and pharmacodynamics
- Drug classes and mechanisms of action
- Adverse drug reactions and interactions

4. Therapeutic Management of Ocular Diseases

- Anti-infective agents
- Anti-inflammatory and immunosuppressive agents
- Glaucoma medications

5. Ocular Therapeutics in Practice

- Prescribing guidelines and regulations
- Patient education and compliance
- Monitoring and managing treatment outcomes

6. Case Studies and Clinical Applications

- Real-world scenarios and case discussions
- Integrating diagnostic and therapeutic approaches

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Ocular Therapeutics Handbook: A Clinical Manual" by Bruce Muchnick
- 3. "Pharmacology for the Primary Care Provider" by Marilyn Winterton Edmunds and Maren Stewart Mayhew
- 4. "Basic and Clinical Pharmacology" by Bertram Katzung

Systemic Ophthalmology

Course Description

This course explores the relationship between systemic diseases and their ocular manifestations. Students will learn to identify and manage eye conditions that arise from systemic health issues. The course aims to provide a comprehensive understanding of how systemic diseases affect the eye, equipping students with the knowledge to integrate systemic health considerations into their optometric practice.

Learning Objectives

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

- 1. Understand the impact of systemic diseases on ocular health.
- 2. Identify ocular manifestations of common systemic diseases.
- 3. Develop diagnostic and management strategies for ocular conditions related to systemic diseases.
- 4. Integrate systemic health considerations into patient care.
- 5. Apply knowledge of systemic ophthalmology in clinical practice.

Topics Covered

1. Introduction to Systemic Ophthalmology

- Overview of systemic diseases affecting the eye
- Importance of systemic health in optometry

2. Cardiovascular Diseases and the Eye

- Hypertensive retinopathy
- o Ocular manifestations of atherosclerosis and embolic diseases

3. Endocrine Disorders and the Eye

- o Diabetic retinopathy
- Thyroid eye disease

4. Autoimmune and Inflammatory Diseases

- Rheumatoid arthritis and ocular involvement
- Systemic lupus erythematosus and the eye
- o Sarcoidosis and ocular manifestations

5. Infectious Diseases and the Eye

- HIV/AIDS-related ocular conditions
- Ocular tuberculosis and syphilis

6. Neoplastic Diseases and the Eye

- Ocular metastases
- Retinoblastoma and ocular melanoma

7. Genetic and Congenital Disorders

- Neurofibromatosis and ocular manifestations
- Marfan syndrome and the eye

8. Systemic Medications and Ocular Side Effects

- o Common medications with ocular side effects
- Monitoring and managing drug-induced ocular conditions

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Ocular Manifestations of Systemic Disease" by Frederick T. Fraunfelder and Roy S. Fraunfelder
- 2. "Clinical Ophthalmology: A Systematic Approach" by Jack J. Kanski and Brad Bowling
- 3. "Systemic Disease and the Eye" by Jack J. Kanski
- 4. "The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease" by Adam T. Gerstenblith and Michael P. Rabinowitz

Clinical Skills for Optometrists III

Course Description

This course is designed to further enhance the clinical skills acquired in Clinical Skills for Optometrists I and II. Students will focus on advanced diagnostic and therapeutic techniques, patient management, and clinical decision-making. The course emphasizes hands-on practice, clinical simulations, and real-world applications to prepare students for complex clinical scenarios and comprehensive patient care.

Learning Objectives

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

- 1. Perform advanced diagnostic and therapeutic procedures.
- 2. Manage complex patient cases with a focus on comprehensive care.
- 3. Utilize advanced clinical equipment and technologies effectively.
- 4. Develop and implement advanced patient management strategies.
- 5. Apply clinical decision-making skills in diverse clinical scenarios.

Topics Covered

1. Advanced Diagnostic Techniques

- Advanced slit lamp biomicroscopy
- Gonioscopy and anterior segment imaging
- Advanced fundus examination and imaging

2. Therapeutic Procedures

- o Advanced contact lens fitting and management
- Low vision rehabilitation techniques
- o Ocular surface disease management

3. Patient Management and Communication

- Managing patients with multiple ocular and systemic conditions
- o Advanced patient communication and counseling techniques
- Interprofessional collaboration and referral processes

4. Clinical Decision-Making

- Complex case studies and clinical scenarios
- Evidence-based practice and clinical guidelines
- Risk management and patient safety

5. Use of Advanced Clinical Equipment

- Optical coherence tomography (OCT)
- Corneal topography and pachymetry
- Visual field analysis and interpretation

6. Clinical Simulations and Practical Sessions

- Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case discussions

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford

4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Disorders of Motility

Course Description

This course provides an in-depth exploration of motility disorders, focusing on their pathophysiology, clinical presentation, and management. Students will learn about the various types of motility disorders that affect the gastrointestinal tract and their implications for ocular health. The course aims to equip students with the knowledge necessary to understand and manage motility disorders in a clinical setting.

Learning Objectives

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

- 1. Understand the basic principles of gastrointestinal motility.
- 2. Identify and describe the pathophysiology of common motility disorders.
- 3. Recognize the clinical manifestations of motility disorders.
- 4. Develop diagnostic and management strategies for patients with motility disorders.
- 5. Integrate knowledge of motility disorders into comprehensive patient care.

Topics Covered

1. Introduction to Gastrointestinal Motility

- Overview of normal gastrointestinal motility
- Mechanisms of peristalsis and segmentation

2. Pathophysiology of Motility Disorders

- Mechanisms of motility dysfunction
- o Genetic and acquired causes of motility disorders

3. Upper Gastrointestinal Motility Disorders

- Achalasia
- Gastroesophageal reflux disease (GERD)
- o Gastroparesis

4. Lower Gastrointestinal Motility Disorders

- Irritable bowel syndrome (IBS)
- Chronic constipation
- Intestinal pseudo-obstruction

5. Systemic Diseases and Motility Disorders

o Diabetes and gastrointestinal motility

- Neurological disorders affecting motility
- 6. Diagnostic Techniques
 - Manometry and pH monitoring
 - Imaging studies and endoscopy

7. Management of Motility Disorders

- Pharmacological treatments
- Dietary and lifestyle modifications
- Surgical interventions

Assessment

- Midterm Exam
- Assignments
- Case Study Analyses
- Final Exam

Recommended Reading

- 1. "Gastrointestinal Physiology" by Leonard R. Johnson
- 2. "Clinical Gastroenterology and Hepatology" by William Y. Chey and Michael D. Crowell
- 3. "Motility Disorders: Pathophysiology and Treatment" by Michael Camilleri
- 4. "Gastrointestinal Motility Disorders" by Satish S.C. Rao and Henry P. Parkman

Optometry Practice I

Course Description

This course introduces students to the foundational principles and practices of optometry. Emphasis is placed on developing core clinical skills, understanding professional responsibilities, and applying theoretical knowledge to practical scenarios. Students will gain hands-on experience through supervised clinical practice, preparing them for more advanced clinical training in subsequent courses.

Learning Objectives

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

- 1. Understand the basic principles of optometric practice.
- 2. Perform fundamental clinical procedures and techniques.
- 3. Develop effective patient communication and history-taking skills.
- 4. Apply theoretical knowledge to practical clinical scenarios.

5. Demonstrate professional behavior and ethical conduct in a clinical setting.

Topics Covered

- 1. Introduction to Optometric Practice
 - Overview of the optometry profession
 - Roles and responsibilities of an optometrist

2. Patient Communication and History Taking

- Techniques for effective patient communication
- Taking comprehensive patient histories

3. Basic Clinical Procedures

- Visual acuity testing
- Refraction and retinoscopy
- Slit lamp examination

4. Diagnostic Techniques

- Tonometry and intraocular pressure measurement
- Fundus examination and ophthalmoscopy
- Visual field testing

5. **Professional and Ethical Conduct**

- Codes of ethics and professional guidelines
- Patient confidentiality and informed consent
- Professional behavior in clinical settings

6. Clinical Practice and Simulations

- Hands-on practice with clinical skills
- Simulated patient scenarios and case studies

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Clinical Placement I

Course Description

This course provides students with hands-on clinical experience in a supervised setting. Students will apply the knowledge and skills acquired in their coursework to real-world clinical scenarios. The placement aims to enhance students' clinical competencies, professional behavior, and understanding of patient care in optometry. Through this experience, students will develop their ability to work effectively within a healthcare team and provide high-quality patient care.

Learning Objectives

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

- 1. Apply theoretical knowledge to clinical practice.
- 2. Perform comprehensive eye examinations and diagnostic procedures.
- 3. Develop effective patient communication and management skills.
- 4. Demonstrate professional behavior and ethical conduct in a clinical setting.
- 5. Work collaboratively within a multidisciplinary healthcare team.

Topics Covered

1. Orientation and Introduction to Clinical Practice

- Overview of clinical placement objectives and expectations
- Introduction to the clinical environment and team

2. Patient Communication and History Taking

- Techniques for effective patient communication
- Taking comprehensive patient histories

3. Clinical Examination Techniques

- Visual acuity testing
- Refraction and retinoscopy
- Slit lamp examination
- Tonometry and intraocular pressure measurement

4. Diagnostic Procedures

- Fundus examination and ophthalmoscopy
- Visual field testing
- Corneal topography

5. Patient Management and Care

- Developing treatment plans
- Patient education and counseling
- Follow-up and continuity of care

6. Professional and Ethical Conduct

- Codes of ethics and professional guidelines
- Patient confidentiality and informed consent
- Professional behavior in clinical settings

Assessment

- Clinical Performance Evaluations
- Reflective Journals
- Case Study Presentations
- Final Clinical Competency Assessment

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Optometry Practice II

Course Description

This course builds on the foundational skills and knowledge acquired in Optometry Practice I. Students will further develop their clinical competencies, focusing on advanced diagnostic techniques, patient management, and clinical decision-making. The course emphasizes hands-on practice, clinical simulations, and real-world applications to prepare students for more complex clinical scenarios and comprehensive patient care.

Learning Objectives

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

- 1. Perform advanced diagnostic procedures and interpret clinical findings.
- 2. Manage complex patient cases with a focus on differential diagnosis.
- 3. Utilize advanced clinical equipment and technologies.

- 4. Develop effective patient management and communication strategies.
- 5. Apply clinical skills in a variety of real-world scenarios.

Topics Covered

- 1. Advanced Diagnostic Techniques
 - Optical coherence tomography (OCT)
 - Corneal topography
 - Visual field analysis

2. Patient Management and Communication

- Managing patients with complex ocular conditions
- Effective communication strategies for diverse patient populations
- Patient education and counseling

3. Clinical Decision-Making

- Differential diagnosis and clinical reasoning
- o Evidence-based practice in optometry
- Case studies and clinical scenarios

4. Advanced Use of Clinical Equipment

- Handling and maintenance of advanced diagnostic tools
- Calibration and troubleshooting of clinical instruments

5. Specialized Clinical Skills

- Contact lens fitting and management
- Low vision assessment and rehabilitation
- Pediatric optometry and managing special populations

6. Clinical Simulations and Practical Sessions

- Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case discussions

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

1. "Clinical Procedures in Primary Eye Care" by David B. Elliott

- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Clinical Practice II

Course Description

This course builds on the foundational clinical experience gained in Clinical Practice I. Students will further develop their clinical skills, focusing on advanced diagnostic techniques, patient management, and clinical decision-making. The course emphasizes hands-on practice in a supervised clinical setting, preparing students for independent practice and more complex clinical scenarios.

Learning Objectives

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

- 1. Apply advanced diagnostic and therapeutic techniques in clinical practice.
- 2. Manage complex patient cases with a focus on comprehensive care.
- 3. Utilize advanced clinical equipment and technologies effectively.
- 4. Develop and implement advanced patient management strategies.
- 5. Demonstrate professional behavior and ethical conduct in a clinical setting.

Topics Covered

- 1. Advanced Diagnostic Techniques
 - Optical coherence tomography (OCT)
 - Corneal topography
 - Visual field analysis

2. Therapeutic Procedures

- Advanced contact lens fitting and management
- Low vision rehabilitation techniques
- o Ocular surface disease management

3. Patient Management and Communication

- o Managing patients with multiple ocular and systemic conditions
- Advanced patient communication and counseling techniques
- Interprofessional collaboration and referral processes

4. Clinical Decision-Making

- Complex case studies and clinical scenarios
- Evidence-based practice and clinical guidelines
- Risk management and patient safety

5. Use of Advanced Clinical Equipment

- Handling and maintenance of advanced diagnostic tools
- Calibration and troubleshooting of clinical instruments

6. Clinical Simulations and Practical Sessions

- o Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case discussions

Assessment

- Clinical Performance Evaluations
- Reflective Journals
- Case Study Presentations
- Final Clinical Competency Assessment

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Project Work I

Course Description

This course introduces students to research methodologies and the scientific process within the field of optometry. Students will engage in independent research projects under the supervision of faculty members. The course aims to develop students' research skills, including literature review, hypothesis formulation, experimental design, data collection, analysis, and presentation of findings.

Learning Objectives

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

- 1. Conduct a thorough literature review on a selected research topic.
- 2. Formulate a research hypothesis and design an appropriate experimental study.
- 3. Collect and analyze data using appropriate research methods.

- 4. Present research findings in both written and oral formats.
- 5. Demonstrate an understanding of ethical considerations in research.

Topics Covered

- 1. Introduction to Research in Optometry
 - Overview of research methodologies
 - Importance of research in optometry

2. Literature Review and Hypothesis Formulation

- Conducting a comprehensive literature review
- o Identifying research gaps and formulating hypotheses

3. Experimental Design and Methodology

- Designing experiments and selecting appropriate methods
- Ethical considerations in research

4. Data Collection and Analysis

- Techniques for data collection
- Statistical methods for data analysis

5. **Presentation of Research Findings**

- Writing research reports and papers
- Preparing and delivering oral presentations

6. Ethical Considerations in Research

- Understanding research ethics
- Obtaining informed consent and ensuring confidentiality

Assessment

- Research Proposal
- Literature Review
- Data Collection and Analysis Report
- Oral Presentation
- Final Research Report

Recommended Reading

- 1. "Research Methodology: A Step-by-Step Guide for Beginners" by Ranjit Kumar
- 2. "The Craft of Research" by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams
- 3. "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches" by John W. Creswell and J. David Creswell

4. "Optometry: Science, Techniques and Clinical Management" by Mark Rosenfield and Nicola Logan

Optometry Practice III

Course Description

This course builds on the skills and knowledge acquired in Optometry Practice I and II. Students will focus on advanced clinical techniques, patient management, and the integration of new technologies in optometric practice. The course emphasizes hands-on practice, clinical simulations, and real-world applications to prepare students for independent practice and complex clinical scenarios.

Learning Objectives

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

- 1. Perform advanced diagnostic and therapeutic procedures.
- 2. Manage complex patient cases with a focus on comprehensive care.
- 3. Utilize advanced clinical equipment and technologies effectively.
- 4. Develop and implement advanced patient management strategies.
- 5. Demonstrate professional behavior and ethical conduct in a clinical setting.

Topics Covered

1. Advanced Diagnostic Techniques

- Optical coherence tomography (OCT)
- Corneal topography
- Visual field analysis

2. Therapeutic Procedures

- o Advanced contact lens fitting and management
- Low vision rehabilitation techniques
- o Ocular surface disease management

3. Patient Management and Communication

- Managing patients with multiple ocular and systemic conditions
- Advanced patient communication and counseling techniques
- Interprofessional collaboration and referral processes

4. Clinical Decision-Making

- o Complex case studies and clinical scenarios
- Evidence-based practice and clinical guidelines
- o Risk management and patient safety

5. Use of Advanced Clinical Equipment

- Handling and maintenance of advanced diagnostic tools
- o Calibration and troubleshooting of clinical instruments

6. Clinical Simulations and Practical Sessions

- o Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case discussions

Assessment

- Midterm Exam
- Assignments
- Practical Assessments
- Final Exam

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford
- 4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Clinical Placement III

Course Description

This course provides advanced clinical experience in a supervised setting, building on the skills and knowledge acquired in Clinical Placement I and II. Students will engage in more complex patient care, refine their diagnostic and therapeutic techniques, and enhance their clinical decision-making abilities. The course aims to prepare students for independent practice by providing hands-on experience with a diverse patient population.

Learning Objectives

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

- 1. Apply advanced diagnostic and therapeutic techniques in clinical practice.
- 2. Manage complex patient cases with a focus on comprehensive care.
- 3. Utilize advanced clinical equipment and technologies effectively.
- 4. Develop and implement advanced patient management strategies.
- 5. Demonstrate professional behavior and ethical conduct in a clinical setting.

Topics Covered

1. Advanced Diagnostic Techniques

- Optical coherence tomography (OCT)
- Corneal topography
- Visual field analysis

2. Therapeutic Procedures

- o Advanced contact lens fitting and management
- Low vision rehabilitation techniques
- Ocular surface disease management

3. Patient Management and Communication

- Managing patients with multiple ocular and systemic conditions
- o Advanced patient communication and counseling techniques
- Interprofessional collaboration and referral processes

4. Clinical Decision-Making

- Complex case studies and clinical scenarios
- Evidence-based practice and clinical guidelines
- Risk management and patient safety

5. Use of Advanced Clinical Equipment

- Handling and maintenance of advanced diagnostic tools
- Calibration and troubleshooting of clinical instruments

6. Clinical Simulations and Practical Sessions

- o Hands-on practice with advanced clinical skills
- Simulated patient scenarios and case discussions

Assessment

- Clinical Performance Evaluations
- Reflective Journals
- Case Study Presentations
- Final Clinical Competency Assessment

Recommended Reading

- 1. "Clinical Procedures in Primary Eye Care" by David B. Elliott
- 2. "Clinical Optometry: Principles and Practice" by Andrew Keirl and Caroline Christie
- 3. "The Slit Lamp Primer" by Janice K. Ledford

4. "Clinical Skills for the Ophthalmic Examination" by Janice K. Ledford and Valerie M. Sanders

Project Work II

Course Description

This course continues the research experience initiated in Project Work I, allowing students to further develop their research skills and complete their independent research projects. Students will engage in advanced research activities, including data collection, analysis, and interpretation, under the supervision of faculty members. The course aims to enhance students' ability to conduct independent research and contribute to the field of optometry.

Learning Objectives

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

- 1. Conduct advanced data collection and analysis.
- 2. Interpret and discuss research findings in the context of existing literature.
- 3. Present research findings in both written and oral formats.
- 4. Demonstrate an understanding of ethical considerations in research.
- 5. Develop a comprehensive research report that contributes to the field of optometry.

Topics Covered

1. Advanced Research Methodologies

- Refining research questions and hypotheses
- Advanced experimental design and methodology

2. Data Collection and Analysis

- Techniques for advanced data collection
- Statistical methods for data analysis

3. Interpretation of Research Findings

- Discussing results in the context of existing literature
- Identifying implications and limitations of research

4. Presentation of Research Findings

- Writing research reports and papers
- Preparing and delivering oral presentations

5. Ethical Considerations in Research

- Understanding research ethics
- Obtaining informed consent and ensuring confidentiality

6. Final Research Report

- Structuring and writing the final research report
- Peer review and feedback

Assessment

- Research Proposal
- Data Collection and Analysis Report
- Oral Presentation
- Final Research Report

Recommended Reading

- 1. "Research Methodology: A Step-by-Step Guide for Beginners" by Ranjit Kumar
- 2. "The Craft of Research" by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams
- 3. "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches" by John W. Creswell and J. David Creswell
- 4. "Optometry: Science, Techniques and Clinical Management" by Mark Rosenfield

CAPITAL OPERATIONAL BUDGET FOR BACHELOR OF SCIENCE: OPTOMETRY

The programme budget is shown in the table below:

Capital Operational Budget for the Bachelor of Science: Optometry This budget projection calculation is based on forty students per year, covering two semesters, at a cost of R52,000 per student.					
Description	2023	2024	2025	2026	TOTAL
Equity Financing	7554354	-	-	-	7554354
BSc – Optometry	2008890	12953250	14407650	19861650	49231440
Other	152712	192708	254520	363600	963 540
TOTAL	9715956	13145958	14662170	20225250	57749334
Expenditure					
Administrative Costs	690190	1090800	1090800	1090800	3962589
Salaries and Wages	767876	236340	236340	236340	1476896
Equipment Costs	1524073	363600	363600	363600	2614873
Operating Costs	1088626	501768	501768	501768	2593930
Research, Training & Workshops	435451	73811	73811	73811	656883
Construction and Infrastructure	2177248	545400	545400	545400	3813448
Marketing and Studio Recording	217728	36724		36724	291175
Travelling and Accommodation	653175	491587	491587	491587	2127936
Vehicles	-	653171		363600	1016771
Other Expenses	653175	93700	93700	93700	934 274
TOTAL	8207539	4086900	3397006	3797329	19488775
Repayment					
Equity and Dividend Payments	1888590	1888590	1888590	1888590	7554358
Interest - 18%	339948	339948	339948	339948	1359792
Charges and Accounting	66859	66859	66859	66859	267435
TOTAL	2295396	2295396	2295396	2295396	9181584
Total Income	9715956	13145958	14662170	20225250	57749334
Total Expenditure	10502935	6382296	5692402	6092725	28670358
B/Forward	-786979	6763662	8969768	14132525	29078976
B/ Down	-786979	6763662	8969768	14132525	29078976

Join Our Celestial Journey Illuminating Minds, Igniting Innovation. Be Part of the Spark as we Unlock the Universe's Secrets, One Equation at a Time



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Research Beyond Boundaries

