**Bayero University, Kano**

**College of Health Science**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**Proposed 30% addition to the CCMAS Course Structure /Summary**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **100 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-MTH 101 | Mathematics for Health Sciences | 3 | C | 45 | - |
| BUK-COS 101 | Introduction to Computer Sciences | 3 | C | 30 | 45 |
| **TOTAL** | | **6** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **200 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-PIO 203 | Excitable Tissues, CNS, Special Senses Physiology | 2 | C | 30 | - |
| BUK-ANA 201 | General Histology | 2 | C | 30 |  |
| BUK-BCH 201 | Nutrition, Bioenergetics and Enzymology | 2 | C | 30 |  |
| BUK-OPT 201 | Ocular Biochemistry | 3 | C | 45 | **-** |
| **TOTAL** | | **9** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **300 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Units** | **Status** | **LH** | **PH** |
| BUK-OPT 301 | Optometry Computer Appreciation | 3 | C | 30 | 45 |
| BUK-OPT 302 | Biostatistics | 3 | C | 45 |  |
|  | **TOTAL** | **6** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **400 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Units** | **Status** | **LH** | **PH** |
| BUK-GST 401 | Character Building, Professionalism and Team Work in Healthcare | 2 | C | 30 |  |
| BUK-OPT 403 | Community Eye Care | 3 | C | 45 |  |
| BUK-OPT 404 | Ophthalmology Clinical Rotation | 3 | C |  | 135 |
|  | **TOTAL** | **8** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **500 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Units** | **Status** | **LH** | **PH** |
| BUK-OPT 501 | Radiology Clinical Rotation | 3 | C |  | 135 |
| BUK-OPT 502 | Medical Laboratory Rotation | 3 | C |  | 135 |
| BUK-OPT 503 | Applied Ocular Microbiology | 3 | C | 30 | 45 |
| BUK-OPT 504 | Ocular emergency | 3 | C | 30 | 45 |
| BUK-OPT 505 | Sport Vision | 2 | C | 30 | - |
| BUK-OPT 506 | Optometry Managed Care | 3 | C | 45 | - |
|  | **TOTAL** | **17** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **600 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Units** | **Status** | **LH** | **PH** |
| BUK-OPT 601 | Accident and Emergency Clinical Rotation | 3 | C |  | 135 |
| BUK-OPT 602 | Professionalism in Healthcare Practice | 2 | C | 30 | - |
| BUK-OPT 603 | Behavioural Optometry | 3 | C | 30 | 15 |
| BUK-OPT 602 | Visual Psychology & Psychopathology | 3 | C | 30 | 15 |
| BUK-OPT 605 | Pre and Post-Surgical Management | 3 | C | 30 | 15 |
| BUK-OPT 604 | Behavioural Optometry | 3 | C | 30 | 15 |
| **Total** | **TOTAL** | **17** |  |  |  |
|  | **GRAND TOTAL** | **63** |  |  |  |

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**BUK-MTH 101 Elementary Mathematics for Health Sciences (3 Units, Core, LH 45)**

**Senate approved relevance**

Training of well-skilled graduates that can apply the knowledge gained in Elementary mathematics for generating and presenting data, analyzing problems involving integration, differentiation using different methods and evaluate simple biostatical problems in other related courses. This is consistent with the university's vision and mission of providing leadership in research and education in Africa which is intended to develop graduates who are effective communicators, critical thinkers, and skilled at integrating evidence into practice.

**Overview**

The course examines the elementary set theory, subsets, union, intersection, complements, venn diagram, real numbers and integers. This course will cover rational and irrational numbers, real sequences, series, and theory of quadratic equations, binomial theorem, circular measures, and trigonometric functions of angles of any magnitude.

Students will also learn how to evaluate quadratic equations and trigonometric functions,analyse problems involving rational and irrational numbers, Real sequences and solve mathematical problems in other related courses. Additionally, students will learn how to solve simple biostatical problems in other related courses. The objectives of the course, learning outcomes, and Course Contents are provided to address this need.

**Objectives:**

**The objectives of the course are to:**

1. Identify and solve problems involving Set, Subset, Union, Intersection, Complements and use of Venn diagrams
2. Solve Quadratic equations and trigonometric functions
3. Solve problems in trigonometry involving angles of any magnitude
4. Analyze problems involving rational and irrational numbers, Real sequences and series
5. Solve Binomial theorem and circular measure
6. Solve mathematical problems in other related courses.

**Learning Outcomes**

On completion of the course, students should be able to:

1. Identify and solve three problems involving Set, Subset, Union, Intersection, Complements and use of Venn diagrams
2. Solve quadratic equations and trigonometric functions
3. Solve problems in trigonometry involving angles of any magnitude
4. Analyze problems involving rational and irrational numbers, Real sequences and series
5. Solve Binomial theorem and circular measure
6. Solve mathematical problems in other related courses.

**Course Contents**

Elementary set theory. Subsets. Union. Intersection. Complements. Venn diagram. Real numbers. Integers. Rational numbers. Irrational numbers. Mathematical Induction. Sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers; the Argand Diagram. De-Moivre’s theorem. nth roots of unity. Circular measure. Trigonometric functions of angles of any magnitude. Trigonometric formulae.

**Minimum academic standards**

As contained in the NUC MAS

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-COS 101: Introduction to Computing Sciences (3 Units C: LH 30; PH 45)**

**Senate approved relevance**

Training of well-skilled graduates that can apply the knowledge gained in computer sciences for generating and presenting data, analyzing problems. This is consistent with the university's vision and mission of providing leadership in research and education in Africa which is intended to develop graduates who are effective communicators, critical thinkers, and skilled at integrating evidence into practice.

**Overview**

The course describes application of computer in general sciences. This includes the use of computers for basic research, browsing of the internet, education/learning, research, simulation, accessing libraries, soft wares, statistical packages and spreadsheets.

This course will provide overview and comprehensive understanding of computer application in sciences in general with the aim of enhancing learning and offering efficient computer experience. The objectives of the course, learning outcomes, and Course Contents are provided to address this need.

**Objectives**

The objectives of the course are to:

1. state the basic components of computers and other computing devices;

2. describe the various applications of computers;

3. explain information processing and its roles in the society;

4. describe the Internet, its various applications and its impact;

5. explain the different areas of the computing discipline and its specialisations; and

6. demonstrate practical skills on using computers and the internet.

**Learning Outcomes**

At the end of the course, students should be able to:

1. mention the basic components of computers and other computing devices;

2. describe the various applications of computers;

3. explain information processing and its roles in the society;

4. describe the Internet, its various applications and its impact;

5. explain the different areas of the computing discipline and its specialisations; and

6. demonstrate practical skills on using computers and the internet.

**Course Contents**

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

**Lab Work:** Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online materials.

**Minimum academic standards**

As contained in the NUC MAS

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**Department of Optometry**

**OD. Optometry**

## **BUK-PIO 203, Excitable Tissues (CNS & Special Senses) (2 Units, Core, LH=30, PH= 0)**

### **Senate approved relevance**

Special senses of sight, hearing, taste and smell are the communicating channels between the body and the world outside. Apart from being necessary for a normal daily living, they also act as gates for knowledge and pleasure. For Bayero University Kano to achieve its mission and vision of providing cutting edge research and leadership in Africa and beyond, this course remains a priority to providing its graduates with the needed knowledge necessary to connecting one’s internal environment with the outside world.

### **Overview**

The special senses consist of the senses of sight, hearing, taste and smell. The sense organs are located in the head and have connections with the brain. These senses allow the individual to detect and analyze light, sound and chemical signals in the environment. Since the vestibular apparatus is part of the ear in which the hearing apparatus is located, vestibular functions will also be covered in this section even though they are not strictly special senses.

This course is designed to deliver adequate knowledge to optometry graduates on the normal processes and functions of the of eye, ear , human body tissues (General histology) and embryo development (general embryology) The vision (the eye), hearing and balance (the ear, which includes the auditory system and vestibular system) will be covered within Anatomy of the special senses, integrating anatomy with histology and embryology. This course includes lectures and laboratory experiences in the study of the auditory and visual systems, it will provide foundational knowledge for students destined to undertake advanced studies in anatomy and physiology, and will develop analytical laboratory skills.

### **Objectives**

The objectives of the course are to:

1. Explain the steps in excitation-contraction coupling in skeletal muscle
2. Draw and describe the structure of the neuromuscular junction
3. Explain the intracellular factors that can cause muscle fatigue
4. Explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release.
5. Explain how the resting membrane potential is generated
6. Illustrate mechanisms of action potential propagation along both non-myelinated and myelinated axons
7. Explain the disorders that can occur at the neuromuscular junction.
8. Describe the gross structure of the eye and basic physiological optics;
9. Explain the processing of information in the visual cortex and the consequence of a lesion in the higher visual association areas;
10. Illustrate the mechanical structures involved in sound detection;
11. Draw a diagram of the auditory pathways including all central connections;
12. Explain the location, structure, and afferent pathways of taste receptors and taste centers;
13. Explain the location, structure, and afferent pathways of smell receptors
14. Describe the olfactory receptors are activated and the mechanism of olfactory transduction.

### **Learning Outcomes**

On completion of the course, the students should be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles;
5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release;
6. explain how the resting membrane potential is generated
7. state the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion;
8. discuss the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons;
9. describe the principle of the voltage clamp and how it is used to identify the ionic selectivity of channels; and
10. discuss the disorders that can occur at the neuromuscular junction.
11. describe the gross structure of the eye and basic physiological optics;
12. draw a diagram of the retino-thalamo-cortical pathways;
13. describe the pupillary light reflex and its diagnostic value;
14. discuss the processing of information in the visual cortex and the consequence of a lesion in the higher visual association areas; list the mechanical structures involved in sound detection;

### **Course Contents**

Structure and functions of nerves, cardiac muscle, smooth muscle and skeletal muscle, Muscles: structure, excitation, theories of excitation-contraction. Membrane potentials. Nerve generation and conduction of impulse and its physiological properties. Synapses and synaptic transmission. Physiology of vision: structure of the eyeball. Optics – eye an optical instrument. Refraction of light and refractive errors. Accommodation. Visual pathways and visual defects. Structure of retina. Biochemistry of vision. Visual acuity, fields of vision and color vision. Physiology of hearing: Auditory stimulus and sound appreciation. Sound characteristics: pitch, intensity and quality. Auditory pathways, neural basis of audition. Types of deafness and tests of both nerve functions. Audiometry. Vestibular pathway and vestibule-ocular reflex. Physiology of taste: gustatory system receptors – taste buds and sensation of tastes. Afferent pathways. Tests for taste and abnormality of taste. Physiology of smell: olfactory receptors and pathways. Tests of olfaction. Abnormalities of olfaction and olfactometry. Functional organization of CNS. Autonomic neurotransmitters and autonomic effects. Peripheral nervous system. The reflex arc and general properties of reflexes. Receptors and receptor potentials. Cerebrospinal fluid and the blood-brain barrier. The human brain — cerebrum, brain stem, basal ganglia, thalamus, hypothalamus and cerebella. The limbic system. Electrophysiology of the cerebral cortex, the electroencephalogram. Alertness and sleep. Postural regulation and postural reflexes. Speech, learning and memory.

### **Minimum Academic Standards**

As contained in the NUC MAS in addition to a well-spaced physiology laboratory with adequate equipment in line with NUC\_MAS. Physiology kits such as Neuroscience kit, EEG kit and tools, AC/DC differential amplifier, intracellular amplifier, nerve chamber, alga chamber, audio monitor and analog stimulus isolator.

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**OD. Optometry**

## **BUK-ANA 201, General Histology (2 Units, Core, LH=15, PH= 45)**

### **Senate approved relevance**

Training of highly qualified graduates that can appropriately apply the knowledge gained of the basic histology of cells and tissues as essential guides to understanding of underlying causes of most disease conditions that are usually encountered in the day to day practice of optometrists. This is in line with mission of Bayero University Kano of addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates

### **Overview**

Understanding the basic histology cells and tissues is important for intending Optometrists. More specifically, the knowledge of the histology of connective tissues, blood, bone, muscles and nervous tissue are very important to the field of optometric rehabilitation.

The essence is to ensure that students are able to understand the clinical implication of some heamatological, neurological, musculoskeletal and oncological diseases and to effectively evaluate and manage such cases as part of multidisciplinary health team. The objectives of the course, learning outcomes, and Course Contents are provided to address this need:

### **Objectives**

The objectives of the course are to:

1. Explain methods of histology and cytology
2. Explain differential centrifugation
3. Describe histological methods and be able to explain principles of microscopic analysis of X ray diffraction
4. Describe epithelium-classification, structural features, specialization, function blood formed elements of blood, Blood cell formation and bone marrow
5. Identify the connective tissues, Histogenesis and histophysiology
6. Identify muscular tissue, types of muscle, chemistry, molecular basis of muscular contraction, histogenesis and regeneration of muscular tissues.
7. Explain the nervous: structure, types and distribution, peripheral nerve endings, neuroglia, synapse and the relationships of nervous tissue
8. Describe the structure of the blood vascular system, fine structure of the capillary wall (arteries and veins), heart, lymphatic vessels, nodes histogenesis and regeneration
9. Describe the thymus- Histological organization functions, involution of thymus, Mammary Gland, Resting and Active Functions-endocrine control, regression and involution of mammary gland,
10. Describe the Reproductive system (Male &Female) Urinary system

### **Learning Outcomes**

On completion of the course, the students should be able to:

1. Carry out the common histological and cytological methods.
2. Describe differential centrifugation and its uses
3. Illustrate the principles of microscopic analysis
4. Explain epithelial classification, the various structures,
5. Demonstrate connective tissue sections and the various structures
6. Explain muscular tissue, types, chemistry, molecular contraction, and regeneration of muscular tissues.
7. Describe the nervous tissue structure, indicating the various structures and their distributional differences
8. Illustrate the blood vascular system, structures of the capillary wall, heart, lymphatic, nodes
9. Analyze the thymus tissue histologically, their organization, functions, mammary tissue., resting and active functions of endocrine control
10. Demonstrate the structures and specializations of the tissues of reproductive system (male and female)

### **Course Contents**

Methods of Histology and Cytology. Direct observation of living tissues and cell. Examination of killed tissue; Differential centrifugation. Histochemical Methods; Principles of Microscopic Analysis X-ray Diffraction. The cell-nucleus, Cytoplasmic Organelles, cell membrane chemical composition of protoplasm, macromolecules. Cell Division-Mitosis, Meiosis, Factors affecting cell division. Epithelium-Classification. Structural Features. Function Blood-formed elements of blood. Blood cell formation. Destruction of blood cells. The bone marrow. Connective Tissue proper - Extracellular, components, cellular elements chemistry, functions classification, Histological features Histogenesis and histophysiology Cartilage Types, Classification, Chemistry, Regeneration, Regressive change in Cartilage, Histophysiology. The Bone classification. Development of Muscular Tissue. Types of muscle. Chemistry, Molecular basis of Muscular contraction. Histogenesis and regeneration of muscular tissues. The Nervous: structure, types and distribution. Peripheral nerve endings, Neuroglia, synapse and the relationships of nervous. Development of Nervous. Blood Vascular system. Fine structure of capillary wall. Arteries, veins. The heart. Histogenesis of blood vessels and heart. Impulse conducting system. Lymphatic system Vessels. Organs - lymph nodes. Histogenesis and regeneration. The spleen - Histological organization functions. The thymus- Histological organization functions, involution of thymus. Mammary Gland, Resting and Active Functions-endocrine control, regression and involution of mammary gland. Histogenesis. Skin. Endocrine system. Reproductive system (Male & Female).

### **Minimum Academic Standards**

The is in line with what is available in the NUC MAS requirement

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**Department of Optometry**

**OD. Optometry**

**BUK-BCH 204 Nutrition, Bioenergetics and Enzymology (Unit 2, Status Core, LH 30)**

**Senate approved relevance**

Training of highly qualified graduates with adequate theoretical knowledge and clinical skills to offer evidence-based optometric services to clients and patients in various health care settings, rehabilitation centers and sporting centers in line with global best practices. This is in line with mission of Bayero University Kano of addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

This course introduces students to understand nutritional requirements of both the apparently healthy and patients with various heath conations and across different age categories. It is of utmost importance for students to know the appropriate nutritional requirements necessary to facilitate treatment of patient with various eye conditions.

This course also introduces students to understand the appropriate nutritional requirement to facilitate maximal gain in any intervention offered to the patients0. The objectives of the course, learning outcomes, and Course Contents are provided to address this need:

**Objectives**

The objectives of the course are to:

1. Describe nutritive value of different foods (CHO, LIPIDs, proteins, vitamins, etc.) and the practical assessment of nutritional status of persons
2. Explain disease conditions that are related to poor nutrition and recommend appropriate diet
3. Describe changes in nutrition requirement in relation physical activity, aging and weight control
4. Describe energy production from substrates via glycolysis, Kreb’s cycle and electron transport chain, gluconeogenesis, glucogenolysis, oxidative deamination and transamination
5. Explain enzyme classification, nomenclature and how temperature influences enzyme-calalysed reactions and biochemical basis of hormone action and state properties of enzymes, co-enzymes and cofactors

**Learning Outcomes**

At the end of the course, students should be able to:

1. Describe nutritive value of different foods (CHO, LIPIDs, proteins, vitamins, etc.) and the practical assessment of nutritional status of persons
2. Explain disease conditions that are related to poor nutrition and recommend appropriate diet
3. Explain changes in nutrition requirement in relation physical activity, aging and weight control
4. Describe energy production from substrates via glycolysis, Kreb’s cycle and electron transport chain, gluconeogenesis, glycogenolysis, oxidative deamination and transamination
5. Explain enzyme classification, nomenclature and how temperature influences enzyme-catalyzed reactions and biochemical basis of hormone action and state properties of enzymes, co-enzymes and cofactors

**Course Contents**

Nutritive value of foods: carbohydrates, lipids, proteins, vitamins, minerals, water. Nutrition status and nutritional requirements. Malnutrition biochemical definition and causes. Recommended dietary allowances. Assessment of nutritional status. General reaction of carbohydrates, reaction and estimation of serum lipids, determination of serum ascorbic acid. Serum uric acid sources and normal serum values clinical implication of abnormal values. Nutritional disorders: causes, prevention and therapy. Diet and diseases Nutrition in relation to physical activity and ageing. Importance of nutrition. Calorimetry. Energy requirements with reference to age and sex. Thermogenesis, Specific dynamic action. Balance diet across different age groups and role of fibers in diet. Nitrogen balance and its significance. Protein energy malnutrition (Kwashiorkor & Marasmus). High energy compounds in foods. Substrate level phosphorylation. Glycolysis, tricarboxylic acid cycle gluconeogenesis, glycogenolysis, oxidative deamination and transamination. Electron transport chain and oxidative phosphorylation and hexose monophosphate shunt. Enzymes classification and nomenclature. Effects of temperature and pH on enzyme catalyzed reactions Introduction to enzyme inhibition. Intracellular localization of enzymes. Properties of enzymes. Enzyme kinetic and inhibition; Co-enzymes and cofactors. Membranes and transport glycogen synthesis and breakdown. Oxidative deamination and transamination. Urea cycle and disorders. Degradation of amino acid. Syntheses of fatty acids, oxidation of fatty acids. Protein biosynthesis and regulation. Cholesterol: chemistry, synthesis and breakdown. Biochemical basis of hormone action. Drug metabolism. Mineral metabolism and role of calcium formation.

**Minimum academic standards**

A minimum lecture hall capacity for 50 students with a projector and availability of the wireless network

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**OD. Optometry**

**BUK -OPT 201 Ocular Biochemistry (3 units; Core; LH =45 P=)**

**Senate-approved relevance**

To produce doctors of Optometry who can engage research on biochemical, immunological and genetic aspects of eye diseases. It is essential to molecules of life in order to understand the disease development mechanism and the role of blood metabolites having diagnostic value

**Overview**

Ocular biochemistry is engaged in research on biochemical, immunological and genetic aspects of eye disease. It is essential to the molecule of life in order to understand the disease development mechanism and the role of blood metabolites having diagnostic value.

The course will enable the understanding of the pathophysiology of eye diseases, drug action and inaction on eye diseases. It will enable research into new methods of treating contemporary curable and incurable eye diseases. It will provoke research into the understanding of the use of alternative medicine (herbal preparations) in reducing the prevalence of eye diseases in our localities.

**Objectives**

The objectives of the course are:

1. To describe the biochemical pathways involved in functions of various ocular structures
2. To describe the chemical changes that take place during the course of eye disease
3. To describe the chemical relations between drugs and target tissues during therapeutic interventions
4. To describe the various relations between the chemistry of ocular structures and their physiological processes.
5. To describe the dynamics and metabolism of the various structures of the eye
6. To explain the pathways or systems of alternative medicine for eye diseases.

**Learning outcomes.**

At the end of the course, student should be able to;

1. Describe the molecular bases of ocular structures
2. Explain the relations between chemical nature of ocular structures and their functions
3. Highlight the chemical changes in ocular structures during the course of a disease
4. Explain the pathophysiology of eye diseases in relation to drug pharmacodynamics
5. Initiate research on treatment options for eye diseases
6. Provoke research for alternative medicine for eye diseases

**Course Content**

Introduction to ocular biochemistry. Enzymes and ocular catalyst. The Human Cell. Xenobiosis. Tear film and pH. The duplicity theory. Photochemistry of vision. Vitamin A metabolism and vision. Introduction to metabolic processes affecting the eye. Metabolism of the cornea. Metabolism of the lens. Metabolism of the aqueous humor. Rhodopsin cycle. Metabolism of the vitreous. HMP shunt. Leak-pump mechanism. Metabolism of the retina. Ocular biochemical degradation of the eye. Ageing and pathological processes. Ocular immunochemistry. Ocular neurochemistry.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, some biochemical laboratory equipment for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK -OPT 301 Optometric Computer Appreciation (3 units; Core; LH =30; PH=15)**

**Senate-approved relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of our today’s global village. To produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry in a digital local and global environment. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

The Optometric Computer appreciation course is key to the training of Optometry students with a view to fostering their knowledge of the requirements for taking their rightful position as eye care providers in a world with fast development in digital information technology, in order to attain the appropriate status in the health care delivery system.

This course is designed to ensure that students are furnished with the requisite information on how the clinical records and data are imputed and retrieved electronically and applied to case studies presentations and research, thus enable the Optometrist interface with both local and global digital environment.

**Objectives**

The objectives of the course are:

1. Describe a computer hardware and software
2. Explain the Personal computer (PC) fundamentals, the current features of Microsoft office----Word, Excel, Corel Draw, Publisher and power point
3. Highlight the general appreciation of operating a PC
4. Explain simple practical experience in using standard packages such as word processing, databases and spreadsheets
5. Describe the major features of android, iOS
6. Describe how to Manipulate most optometric digital instruments with emphasis on use, save/store, print out and send result
7. Highlight various channels of sharing and communicating data with colleagues and data centers both offline and online with emphasis on use of common devices such as phones, iPad and laptops
8. Explain how to make public clinical presentations both offline and online

**Learning Outcomes**

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

1. Understand the major computer application software
2. Use various application packages to create, store, analyze and export clinical data
3. Understand how to make public clinical presentations both offline and online
4. Know how to prepare clinical data for research, analysis and publishing
5. Understand the basic operations of most digital optometric instruments with emphasis on troubleshooting
6. Explain the major features of android, iOS
7. Understand how to manipulate most optometric digital instruments with emphasis on use, save/store, print out and send result
8. Understand various channels of sharing and communicating data with colleagues and data centers both offline and online with emphasis on use of common devices such as phones, iPad and laptops.

**Course Contents**

Introduction to computer application software using any four (4) of the following major software applications. Review of Database Software Design. Introduction to basic manipulation and troubleshooting. Digital optometric instruments. Software design for Ocular Coherence Tomography. Software Design for Central Visual Field. Software packages for Pachymetry. Software Packages for Biometry. Use of Computer appreciation in practice management. Digital Imaging. Data sharing/exchanging. Diagnostic coding. Computerized clinical support. Electronic referral. Computer guided clinical review and interviews. Dispensing software. Digital IPD meters. Software behind automated lensometry. Software packages for autorefractor/autokeratometry. Introduction to Artificial Intelligence in Optometry.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, with some computers and other IT materials for possible demonstration.

**Bayero University, Kano**

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**Department of Optometry**

**OD. Optometry**

**BUK -OPT 302: Biostatistics (3 units; Core; LH=45; PH=)**

**Senate Approved Relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus, produce Optometrists who would be properly grounded on research and ways that data management and the understanding of biostatistics will strengthen the student’s relevance in a world of increasing knowledge. Biostatistics will give the cutting edge to the trained Optometrist’s understanding in the aspect of analyzing research findings quantitatively, qualitatively, descriptive approach and inferential methods of drawing conclusions on research works. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Biostatistics is designed to enhance the ability of the optometry student on his/her role as a health personnel whose role is not limited to clinical activities but to also research work in the dynamic field of eye care and the health system in general.

This course will enable the optometry students to know the relevance of statistical inferences and statistical computing using software packages such as SPSS, Minitab, Epi-info and introduction to R in research works.

**Objectives**

The objectives of the course are:

1. Describe the different types of data in biostatistics

1. Describe the methods of data collection General appreciation of probability and normal distribution in research work.
2. Describe the methods of data summarization and presentation
3. Describe the Central limit theorem and its relationship with confidence interval estimation
4. Describe Statistical tests for parametric data
5. Describe statistical tests for non-paramentric data
6. Describe and conduct hypothesis testing o difference, association, correlation and regression.
7. Explain the statistical software packages used in Biostatistics such as SPSS, Minitab, Epi-info and R
8. Describe the importance of normal distribution and how it affects the types of tests to be chosen when conducting a hypothesis testing.

**Learning Outcomes**

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

1. Know the basic and foundational background of biostatistics and its importance to medical sciences.
2. Know the different types of variables and its application in research and medical writings
3. Know the different methods of data collections and when to apply them.
4. Know how data are summarized and presented in research findings.
5. Know the application of central tendency and measures of variability in quantitative data summarization.
6. Know the importance of central limit theorem in sample selection from a population.
7. Know the importance of probability and sampling in biostatistics.
8. Know the importance of inferential statistics and how it impacts on decision making in scientific research.
9. State the importance of normal distribution and how it affects the types of tests to be chosen when conducting a hypothesis testing.

**Course Contents**

Introduction to biostatistics. Variables and data. Methods of data collection. Data presentation and summarization. Descriptive statistics. Central tendency and Variability. Probability sampling. Normal distribution. Central limit theorem. Inferential statistics. Confidence interval estimation. Introduction to Hypothesis testing. Parametric tests. Non-parametric tests. Test of difference (Z-test, T-test, F-test and Chi-square (X2). Test of Relationships (correlation and regression). The general linear model.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, with some computers and other IT materials for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-GST 401: Character Building, Professionalism and Team Work in Healthcare. (2 units, Status Core, LH 30)**

**Senate approved relevance**

This course is designed in line with the vision and mission of the Bayero University, Kano to produce graduates that are highly qualified with excellent knowledge and high proficiency in skills capable of delivering excellent, respectful, empathic and culturally attuned healthcare services to society devoid of exploitation. The character, professional outlook as well as the work ethics of the graduates would be sharpened by the course to achieve this goal.

This course would further strengthen the graduates to work as a team in the health sector to achieve the desired objectives. It should encourage individual members’ professional development through appropriate mentorship and character building. The course will discourage the development of the barrage of emerging 21st century societal vices inclusive of, but not limited to drug and substance abuse. In essence the course would entrench the humane and professional aspects of the graduates as they serve the society equipped with knowledge and skills consistent with the vision and mission of the Bayero University, Kano.

**Overview**

A major life expectation of the graduates from this programme is the deployment of their services to a variety of clients including students, colleagues and vulnerable groups in the Nigerian milieu and beyond. Graduates of this programme, working with others, would also be expected to research into, propose, design and implement programmes, working with others, would research into, propose, design and implement policies and legislations in many areas of need to enhance better societal outcomes in health and education.

Accordingly, this course would prepare graduates from this programme to deploy their expertise in knowledge, skills, professionalism and work ethics in a culturally accepted manner, in the various services they offer to a variety of clients in healthcare, academia and other fields of endeavor. The students would be exposed to nature of successful team work, appropriate leadership styles, mentorship and character-building skills and ways of refraining from societal vices such as drug and substance abuse.

**Objectives**

The objectives of the course are to:

1. Describe various types of leadership styles applicable in clinical and academic settings.
2. Describe various skills of mentoring in clinical and academic settings.
3. Enumerate the characteristics of a successful team in achieving team objectives.
4. Describe roles professionalism in various fields of health professional endeavor.
5. Describe the principles and practice of psychology in health care settings.
6. Describe the principles of effective communication for general public patients and healthcare team.
7. Discuss the essentials of successful character building for various personality traits.
8. Describe the general principles of ethics in medicine and health care research.
9. Explain risk factors and preventive strategies for substance abuse.

**Learning Outcomes**

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

1. Identify at least three common types of leadership styles with 2 merits and demerits of each.
2. Discuss any two theories of leadership that could be applied in healthcare.
3. Identify at least three mentoring skills needed by all healthcare professionals.
4. Enumerate four attributes of a successful team.
5. Mention five circumstances where professionalism is required to meet client needs and expectations.
6. Discuss human behaviour and its application in health counselling and Enumerate 4 character traits each for 3 personality types.
7. To demonstrate effective communication skills in dealing with the clients, and the general public.
8. Mention 4 ethical challenges and 4 appropriate ethical principles to address them in a clinical practice.
9. Enumerate 4 preventive strategies to address 3 forms of drug abuse and to conduct counselling sessions.

**Course Contents**

Concept of leadership and meaning of leaders. Theories, principles and styles of leadership. Methods of developing team wisdom. Team work as a personal skill. Creating powerful partnership in mentoring. Mentoring and mentoring skills: Stages of formal mentoring relationships. Introduction to professionalism in healthcare practice. Communication and interpersonal skills. Introduction to general psychology and medical psychology.

Counselling psychology in applied psychology. Definition, principles and application of effective communication skills in healthcare settings. The principles of Character Building and types personality traits. Philosophical concepts of Character Building. Code of ethics and principles for various health professions. Case scenarios in health care and their ethical implications. Introduction to psychoactive substances and their clinical manifestations. Cultural perspectives and management strategies in psychoactive substance abuse.

**Minimum academic Standards**

A lecture hall with a minimum seating capacity of fifty students with a projector and flip chart

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK –OPT 403 Community Eye Care (4 units; Core; LH =45; PH=)**

**Senate Approved Relevance**

To train Doctors of Optometry (OD’s) who are knowledgeable and grounded with the diversities in the different parts of the world as this will enable them practice anywhere in the world. This course will enable trained optometrist to proffer solutions to grassroot eye problems in the community. This course emphasizes trained optometrists know that eye care interventions should be targeted at the micro (community) level as this will enhance a positive drastic reduction of preventable blindness and mitigating the impact of non-preventable causes of blindness in the community, nation and the world at large. This is in agreement with the BUK mission to provide training that will benefit mankind.

**Overview**

Community eye care is important to the training of an optometry students as it enhances their understanding of the burden of blindness and visual impairment at the community level. This course is designed to provide the students with theoretical bases to which they can approach common community related eye problems in this environment.

Also, this course ensures that students are equipped with the right community preparedness in eyecare intervention as this translate to high impact on communities and the world at large. Practical examples of the immediate environment will be illustrated to further drive home the course objectives.

**Objectives**

The objectives of the course are:

1. Describe a community and the different types of community
2. To describe community eye care and community diagnosis
3. To explain the Alma Ata declaration and its importance to Primary eye Care
4. To describe the burden of blindness assessment at the community level
5. To identify factors that strengthens community eye care
6. To describe the impact of the community on the global prevalence of blindness
7. To explain the different Community eye care models in Nigeria.

**Learning Outcomes**

At the end of the course, students should be able to;

1. Defined characteristics of a community
2. Approach to community participation
3. Know the Different types of community diagnosis
4. Know the relevance of Primary Health Care to a sustaining community eye care
5. Know different community eye care models in Nigeria.
6. Describe the factors that strengthens community eye care
7. Explain the impact of the community on the global prevalence of blindness.

**Course Contents**

The concept of ‘community’. Community diagnosis and community mobilization. Eye Health Need Assessment. Eye Health Education and Promotion. The Alma Ata Declaration and Primary Health Care. Integration of Primary Eye Care in to Primary Health care. Definitions of blindness and visual impairment. Global initiatives of VISION 2020 (The Right to Sight) and beyond. Universal eye health: a global action plan 2014-2019. Causes of visual impairment in our locality. Avoidable blindness. Early interventions. Impacts of blindness and visual impairment in Nigeria and globally. Issues in the prevention and control of major blinding eye diseases. Understanding the social determinants of blindness and visual impairments. Health systems and eye health. An Overview of indigenous eye care models in Nigeria.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 404: Ophthalmology Clinical Rotation (3 units; Core; LH=; PH=135)**

**Senate approved relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry.

The course will enable the trained Optometrist be able to proffer solutions to ocular anomalies that have abnormal presentation except with radiological diagnostic work up in its diagnosis. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Ophthalmology clinical rotation is designed to enhance the diagnostic clinical ability of the optometry students as the ever-expanding medical field depends on objective examination to ascertain certain diagnosis. This course enables the optometry students to learn the procedures, indications and contraindications of certain diagnostic work up.

This clinical rotation will expose the students to the ophthalmology diagnostic processes and know those specific ocular diagnostic procedures of benefits to his training.

**Objectives**

**The objectives of the course are:**

1. To describe the difference between single vision lenses, bifocal and trifocal.
2. To extended focus lenses stock or grind lenses
3. To state the clinical application of various Optometric Instruments.
4. To explain the clinical application of visual function test namely visual acuity, stero-acuity, contrast
5. To describe clinical application of Direct/Indirect Ophthalmoscopy, Retinoscopy, Keratometry and Tonometry on patients.
6. To know the application of Phorometric test on patients.
7. To explain clinical application of ophthalmic diagnostic drugs, e.g. (Cycloplegics & fluorescein strip).
8. To state the competency in the diagnosis of ocular abnormalities.

**Learning Outcomes**

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

1. Identify different lens types, indication for selecting the lenses and the different types of frames with their specifications for different patients.
2. Demonstrate competency in the use of various Optometric instruments on patients.
3. Demonstrate competency, the procedures and interpretation of their results.
4. Demonstrate competency in the procedure; objective and subjective refraction. Be able to demonstrate competency in the use of drugs in ocular diagnosis e.g. Refraction etc.
5. Identify the instruments, demonstrate competency the procedures and evaluate the various visual functions test.
6. Identify the instruments and demonstrate competency in the procedure of eye examination.
7. Demonstrate competency the clinical management of ocular emergencies, referral and referral chains.
8. Demonstrate competency in the diagnosis of ocular abnormalities.

**Course Contents**

Comprehensive vision and eye health examination. Preliminary eye examinations. Visual acuity assessment. Glaucoma clinical diagnostic evaluation. Cataracts clinical diagnostic evaluation. Ocular effects of many general health disorders.Eye Diseases. Ocular persistent vision loss. Flashes and floaters. Foreign body removal. Pressure patching. Pre-operative assessment. Post-operative assessment. Ocular first aid. Use of the Schematic eye. Minor ophthalmic procedure. Introduction to ocular Anaesthesia. Interpretation of OCT results. Interpretation of CVF results. IOL Calculation. Slit lamp biomicroscopy examination. Binocular Indirect Ophthalmoscopy. Ocular biometric examination. Introduction to ophthalmic surgical procedures.

**Minimum academic standards**

A minimum Ophthalmology clinic with about 200 patients capacity for at least 60 students with all the necessary clinical ophthalmic instruments and availability of mini treatment room and theatre for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK –OPT 501 Radiology Clinical Rotation (3 units; Core; LH =; PH=135)**

**Senate Approved Relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry.

The course will enable the trained Optometrist be able to proffer solutions to ocular anomalies that have abnormal presentation except with radiological diagnostic work up in its diagnosis. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Radiology clinical rotation is designed to enhance the diagnostic clinical ability of the optometry student as the ever-expanding medical field depends on objective examination to ascertain certain diagnosis. This course enables the optometry students to learn the procedures, indications and contraindications of certain diagnostic work up.

This clinical rotation will expose the students to the radiological diagnostic processes and know those specific ocular diagnostic procedures of benefits to his training.

**Objectives**

**The objectives of the course are:**

1. To explain the diagnostic imaging techniques.
2. To describe how to carryout radiological work up for a patient Orbital Disease or Ocular Disease using films: Caldwell`s Position, Waters Position, Lateral View, Basilar View.
3. To explain Waters Position considering cases of suspected orbital floor fractures in Trauma. Lateral View considering subtle pathological changes and the depth of lesion indicated.
4. To explain the Basilar View considering posterior wall of the orbit, and Optic canal Visualization
5. To explain the Computed Tomography of the eye and orbit; Axial Images of the eye and orbit, Orbit Parallel to orbit axis, Optic Canal, The Optic Nerve, The Horizontal Recti muscles along their entire path. Images of the Oblique muscles, Images of the inferior Rectus muscles.
6. To explain the Magnetic Resonance Imaging (MRI) considering types; Bright Signal Intensity, Intermediate Intensity, Low Intensity.

**Learning Outcomes**

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

1. Order the imaging procedures appropriately considering the indication and contra indications. Be able to fill the Radiology forms correctly making specific request
2. Interpret both Orbits when viewed and understanding Coronal Section (Caldwell`s position) of viewing both Orbits; Sphenoid Wing and Ridges, Part of orbital floor.
3. Interpret Transverse section
4. Interpret Transverse Scan (Basilar View) especially; Posterior wall of the orbit, Maxillary Sinus, Optic Canal, Foramen in the skull.
5. Identify and describe; Orbital fat, Optic nerve, Extra Ocular muscles, Lacrimal Gland, Layers of the eye, the vitreous, The Lens, The Ciliary body, Posterior gland, Cerebral Spinal Fluid. Able to detect ocular pathologies such as; Retinal Detachment, Ocular Tumors, Retinal Tear, Mass, Malignant Melanoma, Tumors of Optic Nerve, Blood vessel, Lacrimal Gland, Thyriod Ophthalmopathy, Orbital Trauma, Optic nerve Glioma, Hernation of fat, Distortion of Muscles.
6. Describe and visualize entire anterior visual pathway.

**Course Contents**

Introduction to radiology posting (observership). Diagnostic imaging techniques. Ocular Ultrasound Scan procedure and interpretation. Coronal Section (Caldwell`s position) of viewing both Orbits. A-scan and B-scan procedure and interpretation. Head and neck X-ray procedure and interpretation. CT (head, neck and emphasis on the orbit) procedure and interpretation. MRI (head, neck and emphasis on the orbit) procedure and interpretation. Ocular Doppler ultrasound Scan. Ocular Angiography. Fluorescein Angiography. Axial MRI. Coronal MRI. Fibre proliferative Source. Basilar View of the orbit. Waters Position considering cases of suspected orbital floor fractures in Trauma. Radiological procedures in ocular emergencies. Radiological procedures in oculoplasty and tumours.

**Minimum academic standards**

A minimum Radiology clinic with about 200 patients’ capacity for at least 60 students with all the necessary clinical radiological instruments and availability of mini-investigation rooms for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK -OPT 502: Medical Laboratory Clinical Rotation (3 units; Core; LH=; PH=135)**

**Senate Approved Relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry. This clinical rotation will strengthen the trained Optometrist clinical prowess and ability to objectively proffer solutions to ocular conditions that have abnormal presentations that needed medical laboratory tests to rule out or confirm the conditions the initiated the tests. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Medical laboratory clinical rotation is designed to enhance the diagnostic ability of the optometry student as the ever-expanding medical field depends more on objective examination to ascertain certain diagnosis. This course enables the optometry students to learn the procedures, laboratory routines and contraindications of certain diagnostic tests.

This clinical rotation will expose the students to the medical laboratory procedures and know those specific tests and diagnostic procedures of benefits to his training.

**Objectives**

**The objectives of the course are:**

1. To know all the ocular or Ophthalmic related systemic laboratory tests (FBC, MP, ESR, Blood Film or Microfilaria, Eye swab MCS, Chlamydia, Syphilis, VDRL, TPHA etc.)
2. To explain specific tests (eg. urinalysis, Blood sugar (random, fasting, and 2hours post prandial), HIV screening, Lipid profile, blood clothing, bleeding and clothing time, renal function test, liver function tests, thyroid function tests, hematology, chemistry and recurrent uveitis Immunological laboratory tests etc.) to request with instructions on how to order them and their indications.
3. To describe Specimen Collection Documentation
4. To state Interpretation of results and Normative values for laboratory tests
5. To explain and illustrate how the procedures are done in the laboratory.
6. To describe the relationship between laboratory and different units/departments in the Hospital

**Learning Outcomes**

At the end of this course, students should be able;

1. To know the specific test to request with instructions on how to order that.

2. To know the pre-operative medical laboratory work up or evaluation of patient awaiting ocular surgery or procedures.

3. To know how to collect the specimen or how to request the collection with the order form for onward delivery to the laboratory.

4. To know how to indicate the condition for immediate referral to the appropriate Practitioners for professional expertise. This is very vital as the bases for referral to the appropriate practitioner for professional attention.

5. To know how to gives instructions on how to order specific test. What instruction the patient needs to follow such as fasting before procedure, etc.

6.To know the Interpretation of these aforementioned laboratory results and their Methodologies.

**Course Contents**

Introduction to medical laboratory set up. Pre-operation Medical Evaluation of patient awaiting ocular surgery or procedures. Full or complete blood count (FBC or CBC). Microscopic testing. Macroscopic testing. Total Urinalysis. Virology testing. Chemical pathology tests. Lipid Profile (LP). Histopathology testing. Hematology testing. Liver Function Test (LFT). Thyroid Function Test (TFT) Hematology, Chemistry and Recurrent Uveitis Immunological Laboratory tests. Microbiology test. Blood group serology. Molecular and genetics. Forensic science. Clinical chemistry.

**Minimum academic standards**

A minimum medical laboratory rooms with over 200 patients’ capacity for at least 60 students with all the necessary laboratory instruments and availability of different units of the medical laboratory such as microbiology, chemical pathology, hematology and histopathology units etc for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK- OPT 503 Applied Ocular Microbiology (3 credit units; LH= 45 PH =15).**

**Senate-approved relevance**

Training of high-quality Optometrists who are skilled and knowledgeable in the identification of pathogens affecting the ocular tissues of patients in Nigeria, in agreement with the BUK’s mission to provide sound scientific and professional basis for Optometrist capable of working anywhere in Nigeria and elsewhere. Relevance is seen in Optometrist from BUK being able develop hospital-based infection control principles and manage antimicrobial drug resistance thereby improving ocular surface disease diagnosis and management

**Overview**

Ocular Microbiology is important in the training of Optometry students to reduce wrong diagnosis of ocular surface infections. This highlights the importance of preparing students in Optometry with the skills and techniques for sample collection and culturing.

This course is designed to expose students to eye infections in ophthalmic practice and educate them on how to prevent and manage antibiotic resistance infections. Also, to build the capacity of students in infection control principles in the occurrence of diseases like Ebola virus or Corona virus

**Objectives**

**The objectives of the course are:**

1. To describe the principles of infection.

2. To know hospital acquired diseases and common eye infections gotten from ophthalmic practice.

3. To explain causative agents and mode of transmission of infections.

4. To describe the principles of infection control.

5. To explain the modes of antimicrobial drug resistance.

6. To describe how to prevent antibiotic resistance infections.

7. To state the ocular implications of current epidemic diseases like Ebola and Corona virus.

8. To conduct laboratory exercises on techniques for ocular surface sample collection and culturing

**Learning outcomes:**

At the end of the course, students should be able to;

1. Know the principles of infection.

2. State hospital acquired diseases and common eye infections gotten from ophthalmic practice.

3. Explain causative agents and mode of transmission of infections.

4. Describe the principles of infection control.

5. Explain the common modes of antimicrobial drug resistance.

6. Describe how to prevent antibiotic resistance infections

7. State the ocular implications of current epidemic diseases like Ebola and Corona virus

8. Conduct ocular surface sample collection and culturing

**Course Contents**

Principles of infection. Ocular manifestation of infectious diseases. Hospital eye infection. Causative agents and mode of transmission. Specific considerations for infection control in ophthalmic practice. Collection of infection samples from eye clinic. Culturing techniques. Antibiogram interpretation and therapeutic application. Ocular immunity. Sterilization in ophthalmic practice. Antimicrobial resistance. Rationale for antimicrobial resistance study Common modes of antimicrobial drug resistance. Fungal resistance. Actions to fight resistance. How to prevent antibiotic resistance. Infections and general infection control principles in hospital practice. Ocular implication of current epidemic diseases e.g Ebola, Covid-19.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, some microbiology laboratory equipment for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 504 Ocular Emergency (3 units; Core; LH =30; PH=15)**

**Senate-approved relevance**

To train Doctors of Optometry who would intervene in emergency ocular disease conditions that can lead to serious visual impairment or blindness within hours or days particularly in the Accident and emergency units.

To produce Optometrists who would offer comprehensive eye care services including ocular emergency interventions in accident and emergency cases. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Eye ocular emergencies include cuts, scratches, penetrating injuries, chemical and thermal exposures to the eye or eye lids. Certain eye infections and other medical conditions such blood clots and Glaucoma also need immediate medical attention

This course would enable the trained Optometrist understand the principles of ocular emergency interventions, carry out ocular first aid, treatment and referrals where necessary

**Objectives**

**The objectives of the course are to:**

1. Describe the principles of Health emergencies

2. Describe Ocular emergencies

3. Differentiate between True and Urgent ocular emergencies

4. Describe emergency ocular diseases

5. Describe the tools used in managing various ocular emergency conditions

**Learning Outcomes**

At the end of the course, students should be able to;

1. Know the principles of Ocular emergencies
2. State Health emergency laws
3. Know Ocular emergency diseases
4. Able to carry out ocular emergency procedures
5. Manage Ocular emergencies

**Course Contents**

Meaning of Health Emergency. True and Urgent emergency. The principles of Health emergency management. Common signs and symptoms in ocular emergency. Diagnosis and treatment of Orbital cellulitis. Diagnosis and treatment of Endophthalmitis. Diagnosis and Treatment of Exposure Keratitis. Diagnosis and management of Microbial Keratitis. Diagnosis and management of Ophthalmia Neonatorum. Diagnosis and treatment of Retinal Detachment. Diagnosis and management of ocular Chemical burns. Diagnosis and management of ocular Thermal burns. Diagnosis and treatment of Ocular Trauma. Diagnosis and management of Ocular Trauma. Diagnosis and treatment of Penetrating eye injuries. Make up of Ocular First aid box. Production of Fluorescein strips.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, with some Ophthalmic equipment and a mini ocular treatment room for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 505 Sports Vision (2 units; Core; LH =45; PH=)**

**Senate-approved relevance**

To train Doctors of Optometry (OD’s) who are knowledgeable and have clinical expertise and diverse orientation to practice the profession of Optometry in any specialty of optometry in any part of the world. This will enable students in training to have a complete knowledge and the knowhow to prepare for the future of their practice as sport has gained global relevance in social and economic context. This is in agreement with the BUK mission to provide such training.

**Overview**

Sport vision is designed to enhance the clinical ability of students in a wide and booming field as the sport sector. Students will know from this course the specialty skills that can be applied in cases that involves sport people. A key part of the world economy revenue is generated from sporting activities and the visual needs of the person is of great concern.

This course will expose the student to the uniqueness of the people in the sport world and the different mean and ways of attending to problems of professional sporting people.

**Objectives**

The objectives of the course are**:**

1. To explain the historical background of Optometry in sports

2. To explain the different visual recommendations for different types of sports

3. To explain the different types of treatment for different types of sportsmen

4. To describe the recommendations in management of athletes with refractive errors.

5. To explain how to improve visual performance of athletes

6. To demonstrate the vision training programs for althletes.

**Learning Outcomes**

At the end of this course, students should be able to;

1. Enumerate the visual recommendations for sport people and athletes
2. Explain the relationship between eye and body coordination
3. Evaluate visual performance of athletes
4. Describe visual performance of athletes
5. List the recommendations in management of athletes with refractive errors.
6. Demonstrate the vision training programs for athletes.

**Course Contents**

Historical background of optometry in sport activities. Visual recommendations for all sporting activities. Connection between our eyes and our body communication. Eye-hand communication. Eye-foot communication. Eye-body communication. Recommendation for contact sports. Athletes and visual need. Advice effect weather on visual aids. Physical impact on the visual aids and the athletes. Refractive error correction methods. Appropriate refractive error correction methods for each type of sport. Corrective glasses and sport. Contact lenses and sport. Refractive surgery and sport. Vision training program to improve performance of athletes. How to use most common Sport Vision equipment in optometric practice. The optometrist role in Ocular emergencies in sports.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, with some different sports equipment for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 506 Optometry Managed Care (3 units; Core; LH =45; PH=)**

**Senate-approved relevance**

Optometry practice is relevant in the on-going transformation of the health care system and the OD training will prepare tomorrow’s Optometrist for population-based clinical practice that blends advocacy and allocation of roles. This course will equip the students with the knowledge of new emerging models of practice as they prepare to render secondary eye care services in a larger health care system which has the patient at the center of it all.

**Overview**

Managed care is the future of medical care. It is aimed at making acceptable, affordable and standardized eye care available to all. It adopts a population-based approach to clinical practice that incorporates public health as well as individual medical care strategies.

The Optometrist would play strategic role as a primary and secondary eye care provider with linkages to all providers in interdisciplinary eye care .

**Objectives**

**The objectives of the course are to:**

1. Explain managed care model of health care delivery.
2. Describe the types of managed care in Nigeria, their features and challenges with a view to equipping them with the necessary skills to manage proffering possible solutions.
3. Explain the roles of the optometrist in managed care
4. Explain managed care model of health care delivery.
5. Describe the types of managed care in Nigeria, their features and challenges with a view to equipping them with the necessary skills to manage proffering possible solutions.
6. State the roles of the optometrist in managed care

**Learning Outcome**

At the end of the course, students should be able to;

1. Outline the models of delivering medical care
2. Define managed care and state its types
3. Explain the goals of managed care
4. Identify the features and challenges of managed care
5. Proffer solutions to the challenges identified
6. Explain the role of Optometry in managed care and the requirements for being on-boarded as a secondary care provider

**Course Contents**

Background to and history of medical care. Models for delivering medical care. Definition of managed care. The goal of managed care. Features or components of managed care. Challenges of medical care. Solutions in managed care. Legal obligations versus moral obligations in managed care. Standard of care. Types of Managed care with examples. The National Health Insurance Authority. Health Management Organizations. Primary and secondary care provision in managed care. Optometry as a secondary care provider in managed care. Optometric services covered. List of exclusions. Requirements for on-boarding optometric practices as secondary providers. The service level agreement.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 601: Accident and Emergency Clinical Rotation (3 units; Core; LH=; P=135)**

**Senate Approved Relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry. This clinical rotation will strengthen the trained Optometrist understanding in the aspect of emergencies in the health and eye care set up as emergencies are parts of occurrences in the day to day clinical practice. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Accident and emergency clinical rotation is designed to enhance the ability of the optometry student as on his/her role as a care provider on ocular and cases of general emergencies. This course enables the optometry students to learn the procedures, responses initiated and the tact to employ in addressing cases of emergencies.

This accident and emergencies clinical rotation will expose the students to the accident and emergency procedures and know responses and treatment modalities that will be of benefits to his training and practice in the future.

**Specific Objectives**

At the end of the course;

1. To learn what is Urgency

2. To learn what is Emergency

3. To Learn the Emergency number to call (Emergency Medical Service **EMS**)

4. To learn the legal concepts involved in emergencies

5. To learn Record keeping and the Good Samaritan law

6. To know How to check for consciousness.

7. To know How to check for unconsciousness.

8. To know How to provide care for the unconscious Patient.

**Learning Outcomes**

At the end of the course, students should be able to;

1. Explain what is Urgency

2. Describe what is Emergency

3. Know the Emergency number to call (Emergency Medical Service **EMS**)

4. State the legal concepts involved in emergencies

5. Describe record keeping and the Good Samaritan law

6. Know how to check for consciousness.

7. Explain how to check for unconsciousness.

8. Describe how to provide care for the unconscious Patient.

**Course Contents**

Urgency. Emergency. Legal concepts involved in emergencies. Triage. Record keeping. The Good Samaritan law. Checking for consciousness and unconsciousness. Circulation. Rescue Breathing. Defibrillation. CPR. Management of burn injuries in emergencies. Arresting bleeding. Ocular Geriatric emergencies. Management of Ocular Paediatric emergencies. Management of ocular trauma and adnexa injuries. Ocular first aid.

**Minimum academic standards**

A minimum Accident and Emergency clinic with over 200 patients’ capacity for at least 60 students with all the necessary clinical units such as surgery, internal medicine etc and availability of mini-investigation and treatment rooms, pharmacy and side labs etc for possible demonstration.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK–OPT 602 Professionalism in Healthcare Practice (2 units; Core; LH =30; PH=)**

**Senate-approved relevance**

To train Doctors of Optometry (OD’s) who are profoundly professional in the practice of profession of Optometry in any part of the world by producing Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry with world class professionalism.

The course will enable the trained Optometrist be able to professionally proffer solutions to ocular anomalies in a. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Professionalism in Optometry practice hinges on the fact that future healthcare professionals need the interpersonal skills and knowhow when relating with patients and fellow colleagues within the healthcare space. It considers vision in relation to visual demands such as reading, writing and computers to ensure vision is used comfortably. It involves more than classical approach to eye care such eye test, detecting diseases and provide lenses to improve focus of the eyes.

This course involves developing techniques that are important in providing patient-centered care that addresses a patients' physical, emotional, and social needs. This course will alsotrain students the different areas of healthcare practice and network with healthcare professionals in related field.

**Objectives**

The objectives of the course are to:

1. State the principles and values of professionalism in healthcare practice.
2. Develop effective communication and interpersonal skills to build trust and rapport with patients.
3. Know ethical principles and decision-making in healthcare, including patient autonomy, confidentiality, and informed consent.
4. Learn about the importance of teamwork and collaboration in providing high-quality patient care.
5. Know the importance of patient-centered care and the role of addressing patients' physical, emotional, and social needs.
6. Develop the skills for ongoing professional development and self-reflection to improve performance.
7. Apply the knowledge and skills learned in the course through case studies and role-playing exercises.
8. Know the different areas of healthcare practice and network with healthcare professionals in the field.
9. Create a final project that allows students to apply what they have learned in the course to a real-world situation.

**Learning outcomes**

1. Students will be able to articulate the principles and values of professionalism in healthcare practice.
2. Students will be able to demonstrate effective communication and interpersonal skills in building trust and rapport with patients.
3. Students will be able to analyze ethical principles and decision-making in healthcare and apply them to real-world situations.
4. Students will be able to explain the importance of teamwork and collaboration in providing high-quality patient care and demonstrate the ability to work effectively in a team.
5. Students will be able to design and implement a patient-centered care plan and evaluate its effectiveness in addressing patients' physical, emotional, and social needs.

**Course Contents**

Introduction to Professionalism in Healthcare Practice. Communication and Interpersonal Skills. Ethics and Legal Issues. An overview of ethical principles and decision-making. Patient autonomy, confidentiality, and informed consent. Teamwork and Collaboration. Patient-Centered Care. Professional Development and Self-Reflection. Time management and organization. Dealing with stress and burnout. Medical record-keeping and documentation. Medical billing and coding. Patient privacy and security. Diversity and cultural competency. Infection control. Quality improvement and patient safety. Medical research and evidence-based practice.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK-OPT 603 Behavioural Optometry (3 units; Core; LH =30; PH=45)**

**Senate-approved relevance**

To train Doctors of Optometry (OD’s) who are profoundly knowledgeable, with expertise and ethical orientation to practice the profession of Optometry in any part of the world; thus produce Optometrists who would offer comprehensive eye care services, initiate research and provide template of skills for the various specialization in Optometry. The course will enable the trained Optometrist be able to proffer solutions to ocular anomalies particularly developmental and genetic eye disorders. This is in agreement with the BUK mission to provide such training and other contextually-related issues such as environment, economy, society etc.

**Overview**

Behavioral Optometry hinges on the fact that the use of vision is a learned process. It considers vision in relation to visual demands such as reading, writing and computers to ensure vision is used comfortably. It involves more than classical approach to eye care such eye test, detecting diseases and provide lenses to improve focus of the eyes.

This course involves developing techniques and visual skills that would enable comfortable vision by utilizing binocular eye –brain coordination to improve skills to assist with scanning, focusing and help learning and perception.

**Objectives**

**The objectives of the course are:**

1. To describe the anatomy of the visual pathway
2. To describe the physiology of the visual pathway
3. To understand motor and sensory visual information processing from the eye to the brain
4. To describe the measurement of accommodation and convergence and their disorders
5. To describe genetic related diseases.
6. To identify strabismic and non- strabismic anomalies
7. To identify children with learning disabilities and understand the concept of vision training in this group

**Learning Outcomes**

At the end of the course, students should be able to;

1. Highlight the assessment of individuals with strabismic and non-strabismic anomalies
2. Provide treatment for vision problems of eye turn, lazy eyes and refractive errors
3. Detect vision problems that can interfere with reading , writing, computer use and other activities of daily living
4. Enhance the visual abilities of many people with a variety of visual deficits with vision therapy and strategic use of lenses
5. Plan and execute a treatment programme to enhance vision and general performance of people in the classroom and workplace
6. Develop interdisciplinary relationships among professionals in the field
7. Be able to initiate research for the development of the discipline of Behavioural Optometry

**Course Contents**

Overview of Neuroanatomy and Neurophysiology. Review of genetic related diseases. Assessment accommodative disorders. Diagnosis accommodative disorders. Management of accommodative disorders. Assessment of convergence disorders. Diagnosis of convergence disorders. Management of convergence disorders. Assessment of fusion disorders. Diagnosis of fusion disorders. Management of fusion disorders. The diagnosis of strabismus. Management of strabismus. Complications of strabismus. Case presentations of non-strabismic anomalies. Developemental and perceptual assessment of the learning-disabled child. Testing and evaluation of motor skills. Visual form recognition. Development of a treatment programme.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network. Also, with a well-equipped mini side physiological, ophthalmic and clinical optics lab.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK–OPT 603 Advocacy in Optometry (3 units; Core; LH45, PH=)**

**Senate-Approved Relevance**

Doctor of Optometry (OD) training will instill into optometry students the necessary advocacy knowledge and skills as a fundamental part of their training and future practice to be able to engage stakeholders and influence decision making at all levels towards building sustainable eye care systems as far as the grassroots level, and towards implementing global eye health plans.

**Overview**

Eye care advocacy is an integral part of public health projects and global prevention of blindness programmes. This would raise awareness about importance of eye health particularly prevention and treatment of avoidable Blindness

The trained Optometrists would develop advocacy skills in the provision of eye care services at the primary, secondary and tertiary levels in all models of service delivery for Local , National and Global eye care plans.

**Objectives**

**The objectives of the course are:**

1. To describe the concept of advocacy
2. To describe how to identify an advocacy issue
3. To describe key stakeholders involved in an advocacy effort
4. To describe how to set goals and objectives for advocacy strategy
5. To explain advocacy campaign
6. To describe strategies for mitigating risk associated with advocacy
7. To explain key tenets of working with media
8. To describe how to plan for evaluation of advocacy

**Learning outcomes**

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

1. Describe advocacy and the reasons for advocacy
2. Describe how to identify an appropriate advocacy issue
3. Identify key stakeholders involved in an advocacy effort
4. Set goals and objectives for strategy
5. Describe advocacy campaign
6. Develop strategies for mitigating risk associated with advocacy
7. To State key tenets of working with media
8. Develop a plan for evaluation of advocacy

**Course Contents**

Introduction to advocacy. Definition. Types of Advocacy. Identifying an issue for advocacy. Developing an advocacy strategy. Identifying an issue for advocacy. Policy analysis. Building relationships with stakeholders. Goals and objectives for advocacy. Specific actions in advocacy. Developing an advocacy campaign. Developing the advocacy message. Advocacy approaches and tools. Monitoring and evaluation (M & E) of advocacy. Risks in advocacy. Strategies for mitigating risks in advocacy. Working with the media in advocacy.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK- OPT 602 Visual Psychology and Psychopathology (3 credit units; Core; LH 45, PH ).**

**Senate-approved relevance**

Training of high-quality Optometrists who are skilled and knowledgeable in identifying visual and perception challenges as related to the nervous system in agreement with the BUK’s mission to provide sound scientific and professional basis for Optometrist capable of working anywhere in Nigeria and elsewhere. Relevance is seen in Optometrist from BUK being able understand and manage visual and perception problems linked to both the defects in the nervous system and the psychological state of the patient.

**Overview**

Visual Psychology & Psychopathology is important in the training of Optometry students to reduce wrong diagnosis of visual and perception problems linked to both the defects in the nervous system and the psychological state of the patient. This highlights the importance of preparing students in Optometry with the skills and techniques in making the right assessment and proffering the right management regimen.

This course is also designed to educate students on how to identify and manage visual and perception problems linked to both the defects in the nervous system and the psychological state of the patient.

**Objectives**

**The objectives of the course are to:**

1. Describe the nervous system and the cortico-visual centres
2. Appreciate the relationship between light and seeing
3. Explain the attributes of the mind, effect, brain pattern, instinct emotion, and the unconscious mind.
4. Describe the concepts of object attention. Voluntary and involuntary attention
5. Describe terms like mental judgement, judgement of distances and factors involved; depth perception.
6. Explain the common causes of misjudgement
7. Explain the process of perception of motion and illusions
8. Describe the difference between vision and perception.

**Learning Outcomes**

At the end of the course, students should be able to;

1. Describe the difference between vision and perception
2. Describe the nervous system and the cortico-visual centres
3. Appreciate the relationship between light and seeing
4. Explain the attributes of the mind, effect, brain pattern, instinct motion, and the unconscious mind.
5. Describe the concepts of object attention. Voluntary and involuntary attention
6. Describe terms like mental judgement, judgement of distances and factors involved; depth perception.
7. Explain the common causes of misjudgement
8. Explain the process of perception of motion and illusions

**Course Contents**

Review of the nervous system. Cortical and visual centers. Light, seeing, visual efficiency and perceptual acuity. Visual projection and space perception. Attributes of the mind, effect, brain pattern and instinct emotion. The unconscious mind: (identification, reality). Attention, (including mentally ideal, and object attention). Voluntary and, involuntary attention. Projection. Mental perception and percepts. Correction of perception. Concepts in Space perception. Mental space system and Origin. Memory association conditioned reaction and stimulus, reason. Mental judgement, judgement of distances and factors involved. Depth perception. Common causes of misjudgement. Perception of motion and illusions. Clinical demonstrations. Psychopathology.

**Minimum academic standards**

A minimum lecture hall capacity for 60 students with a projector and availability of the wireless network.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Optometry**

**OD. Optometry**

**BUK- OPT 605 Pre and Post-Surgical Co-management. (3 credit units; Core; LH= 30 PH =45).**

**Senate-approved relevance**

Training of high-quality Optometrists who are skilled and knowledgeable in the preparation, advising, management and concealing of patients before and after ocular surgeries. Identification and isolation of surgical conditions with proper referral, in agreement with the BUK’s mission to provide sound scientific and professional basis for Optometrist capable of working anywhere in Nigeria and elsewhere. Relevance is seen in Optometrist from BUK being able to work in primary, secondary and tertiary health facilities with good professional relationship with other partners in the eye care services.

**Overview**

Pre and Post-surgical co-management is important in the training of Optometry students to improve proper management of patients with ocular conditions before and after ocular surgeries. This highlights the importance of preparing students in Optometry with the skills and techniques for identification and isolation of surgical conditions with proper referral system.

This course is designed to expose students to various methods and techniques of ocular surgeries, preparation of patients for surgeries which includes preoperative assessment/testing and post-surgical care. Also, to build the capacity of students in making proper referral and working together with other eye care practitioners in the proper management of the patients.

**Objectives**

**The objectives of the course are to:**

1. Review the scope of optometric practice on pre & post-operative surgical co-management in Nigeria.
2. Explain the relationship of the scope of practice of the eye care team.
3. State and describe different ocular surgeries.
4. Explain the pre-operative assessment needed for different ocular surgeries
5. Describe post-operative care needed by patient.
6. Explain the complications the ocular surgeries.
7. State the refractive changes that occur after ocular surgery
8. Explain how the referral system works.

**Learning outcome**s

At the end of the course, students should be able to;

1. Describe the scope of optometry practice in Nigeria.

2. Describe the relationship of the scope of practice of the eye care team.

3. Explain the different types of ocular surgeries and their indications.

4. Describe the pre-operative assessment for different ocular surgeries.

5. Explain the post-operative management of different ocular surgeries.

6. State the complications of ocular surgeries.

7. Describe the post ocular surgery refractive changes.

8. Describe how to write referral letters.

**Course Contents**

Review of optometric practice in Nigeria. Relationship of the scope of practice of the eye care team. Anaesthesia in eye surgeries. Types of cataract surgeries (ICCE, ECCE). Indications for cataract surgery. Pre-operative assessment. Post-operative management. Complications of cataract surgery. Types of glaucoma surgeries (trabeculectomy, trabeculotomy, glaucoma drainage devices, goniotomy, laser trabeculoplasty, minimally invasive glaucoma surgery). Indications for glaucoma surgery. Pre-operative assessment. Post-operative management. Complications of glaucoma surgery. Corneal surgeries (keratoplasty, photorefractive keratectomy, arcuate keratotomy, LASEK, LASIK, phakic posterior chamber implant, corneal collagen cross-linking, laser induced monovision, karma presbyopic in-lay). Indications for corneal surgery. Pre-operative assessment. Post-operative management. Complications of corneal surgeries. Eye lid excision and biopsy. Blepharoplasty. Pterygium excision surgeries. Pre-operative assessment. Post-operative management and complications of pterygium excision sugeries. Retinal repair surgeries (pneumatic retinopexy, scleral buckling, cryopexy, laser photocoagulation, vitrectomy). Refractive changes secondary to post ocular surgery. Referral systems. Medical report. Patient education and counselling.

**Minimum academic standards**

As contained in the NUC MAS in addition having Ophthalmic equipment and a mini ocular treatment room for possible demonstration.