**Bayero University, Kano (BUK)**

**Faculty of Basic Medical Sciences**

**Department of Anatomy**

**B.Sc. Anatomy**

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

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| **Level 100** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-ANA 121 | Introduction to Anatomy | 2 | C | 30 | - |
| BUK-ANA 122 | Virtual Anatomy and e-Learning Techniques | 2 | C | 15 | 45 |
|  | **Total** | **4** |  |  |  |

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| **Level 200** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-ANA 205 | General Pharmacology | 2 | C | 30 | - |
| BUK-ANA 222 | Man, and His Environment | 2 | C | 30 | - |
| BUK-ANA 223 | Systemic Histology | 3 | C | 30 | 45 |
| BUK-ANA 227 | Systemic Physiology | 2 | C | 30 | - |
|  | **Total** | **9** |  |  |  |

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| **Level 300** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-ANA 321 | Basic Histopathology | 2 | C | 30 | - |
| BUK-ANA 325 | Comparative Anatomy | 2 | C | 30 | - |
| BUK-ANA 327 | Systemic Embryology I | 2 | C | 30 | - |
| BUK-ANA 329 | Neurophysiology | 2 | C | 30 | - |
| BUK-ANA 331 | Clinical and Applied Anatomy | 3 | C | 45 | - |
|  | **Total** | **11** |  |  |  |

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| **Level 400** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-GST 401 | Character Building, Professionalism and Team Work in Healthcare | 2 | C | 30 | 0 |
| BUK-ANA 431 | Histological Methods and Animal Handling | 3 | C | 30 | 45 |
| BUK-ANA 433 | Cell Biology and Tissue Culture | 3 | C | 45 | - |
| BUK-ANA 435 | Forensic Anatomy | 3 | C | 45 | - |
| BUK-ANA 423 | Nutritional Sciences | 2 | R | 30 | - |
| BUK-ANA 434 | Teratology | 3 | C | 45 | - |
| BUK-ANA 424 | Anatomical Data Managements | 2 | C | 30 | - |
|  | **Total** | **18** |  |  |  |

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| **Level** | **70% CCMAS** | **30% Addition to the CCMAS** | **Units** |
| 100 | 26 | 04 | 30 |
| 200 | 23 | 09 | 30 |
| 300 | 21 | 11 | 30 |
| 400 | 14 | 18 | 30 |
| **Total** | **84** | **42** | **126** |

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| **Institution:** Bayero University, Kano | |
| **Faculty:** Basic Medical Sciences | |
| **Department:** Anatomy | |
| **Programme:** B.Sc. Human Anatomy | |
| **BUK-ANA 121: Introduction to Anatomy (2 Unit Core: LH 30: PH 0)** | |
| **Senate approved relevance to mission and strategic goals of the university:**  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. Introduction to anatomy is a fundamental medicine, biology, nursing, kinesiology, physical therapy, and other related fields. It provides students with a common language for communicating about the human body. Healthcare professionals and researchers use precise anatomical terms to communicate with one another, so a thorough understanding of anatomy is necessary for effective communication in these fields. | |
| **Overview:**  Introduction to anatomy is a fundamental course for students pursuing careers in medicine, biology, nursing, kinesiology, physical therapy, and other related fields. It covers the basic structure and function of the human body and provides an essential foundation for understanding how the body works and how diseases affect it. Anatomy is important because it helps us understand the structure of the body and how different systems work together. It provides a basis for understanding the normal function of the body, which is critical for diagnosing and treating diseases and injuries. An understanding of anatomy is also essential for research in medicine and biology.  The graduates of introduction to Anatomy are to have acquired basic knowledge of human anatomy, proficiency in anatomical terminology, understanding of the relationship between structure and function, proficiency in identifying anatomical structures, strong communication skills, ethical and professional conduct, and commitment to continuing professional development. By possessing these skills and knowledge, graduates can contribute to improving patient outcomes and advancing the field of healthcare. Introduction to Anatomy provides a broad overview of the structure and function of the human body, including its major systems and organs. It is designed to provide a foundation for further study in more specialized areas of anatomy and related fields, such as physiology, pathology, and clinical practice. | |
| **Objectives:**  The objectives of introduction to anatomy include to:   1. define basic anatomical terminology (e.g. Abduction and circumduction); 2. be familiar with the basic structure and function of the human body's organs, systems, and tissues (heart, lungs and kidneys); 3. relate between structure and function (e.g. blood and respiration; muscles and movements) 4. recognize of anatomical structures (e.g. bones, muscles and cartilages); 5. integrate anatomical knowledge with clinical practice (e.g. applied anatomy of bone fractures, and nerves injuries); 6. explain anatomical concepts effectively: patients, colleagues, and other healthcare professionals); and 7. engage in lifelong learning (be committed to continuing their education and staying up-to-date with advances in the field of anatomy and healthcare). | |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. explain anatomical terminology: flexion, abduction, coronal; 2. explain the structure and function of the human body's systems and organs: heart, lungs and kidneys; 3. identify anatomical structures: bones, muscles, organs, and systems; 4. apply anatomical knowledge to clinical practice: diagnosis and treating diseases and injuries; 5. acquire ethical and professional conduct: colleagues, and other healthcare professionals; 6. acquire ethical and professional conduct in their interactions: colleagues, and other healthcare professionals; and 7. up-to-date anatomy education: research in field of anatomy and healthcare. | |
| **Course contents:**  Overview of the human body: An introduction to the organization and structure of the human body, including its major systems, organs, and tissues. History of Anatomy: profiles of Hippocrates, Aristotle, Herophilus, Claudius Galen, Leonardo da Vinci. Anatomical terms and terminologies: flexion, extension, adduction, Abduction, rotations, circumduction. Planes of dissection: coronal, transverse, sagittal, parasagittal. Terms of positions: superior, inferior, medial, lateral, proximal, distal, superficial, deep, ipsilateral, contralateral. Pathological terms: acute, chronic, avascular, atrophy, disease, pathology. Disciplines of Anatomy: Endocrinology, Integumentary, Skeletal system: bones of the human body, function, and classification. Muscular system: muscles of the human body, structure, function, and classification. Nervous system: structure, function, and major components. Cardiovascular system: heart, blood vessels, and blood, including their structure, functions, and circulation. Respiratory system: lungs, trachea, and bronchi. Digestive system: structure and functions of the stomach, intestines, and liver. Urinary system: structure and functions of the kidneys and bladder, Reproductive system: structure and functions of the male and female reproductive systems. | |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. | |
| **Institution:** Bayero University, Kano | |
| **Faculty:** Basic Medical Sciences | |
| **Department:** Anatomy | |
| **Programme:** B.Sc. Human Anatomy | |
| **BUK-ANA 122: Virtual Anatomy and e-Learning Techniques (2 Unit Core: LH 15: PH 45)** | |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Virtual anatomy and e-learning has become a necessity in the field of medical education and training today in order to provide accessible, interactive, cost-effective, customizable, and safer learning medical education. It has the potential to revolutionize medical education by providing students with new and innovative ways to learn about the human body. | |
| **Overview:**  Virtual Anatomy refers to the use of advanced technology to create realistic models of the human body, which can be viewed, manipulated, and explored in three dimensions. E-Learning, on the other hand, involves the use of digital technologies to facilitate learning and education. Virtual Anatomy and e-Learning have several benefits for students and educators. For instance, virtual anatomy can provide a safe and controlled environment for students to practice procedures and surgeries, without the need for real-life patients.  Additionally, e-Learning can offer flexibility, allowing students to access educational materials and complete coursework from anywhere with an internet connection. Some of the most common tools used for virtual anatomy and e-learning include 3D modeling software, virtual reality headsets, and online learning management systems. These tools provide students with interactive and engaging learning experiences that can enhance their understanding of complex anatomical concepts. | |
| **Objectives:**  The objectives of virtual anatomy and e-learning techniques include to:   1. list ICT and ICT-based learning tools: instructional software, email, chat, and distance learning program; 2. list world wide web types (Hypertext Markup Language (HTML), Uniform Resource Locator (URL), and Hypertext Transfer Protocol (HTTP)), 3. realize the workings of LMS (Moodle, Canvas, and Google Classroom); 4. list google lectures and seminar presentations platforms: zoom, google meet or teams; 5. recognize interactive whiteboards and google Jamboard (e.g. group discussions and assignments); 6. list 3D anatomy software for learning: AnatoMage, and TeachMe Anatomy; and 7. describe virtual laboratories: virtual dissection, organ simulation; | |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. improve their knowledge of Anatomy: (by using 3D models of complex anatomical structures and functions, interaction with models in real-time, which can help them grasp concepts more effectively); 2. increase retention of information (e.g. by using Virtual Anatomy and e-Learning tools); 3. enhance critical thinking: (by allowing students to interact with and manipulate models, quizzes and assessments); 4. reduce the need for physical textbooks and in-person classes; and 5. personalize learning experience, provision instant feedback and progress tracking. | |
| **Course Contents:**  Introduction to ICT. The Internet and the World Wide Web. Introduction to MS Office. Introduction to e-learning. e-learning resources: e-books, e-libraries, epubs and PDFs, e-learning software, and YouTube. Introduction to LMS: Online assignments, quizzes and CBT examinations. How to use Zoom: Google Meet and Microsoft Teams, Google Classroom, Google Jamboard, Interactive whiteboards. Introduction to Virtual Anatomy: Online laboratory (e.g. Pearson’s Education Practice Anatomy Laboratory 2.0 Software), Virtual cadavers and dissection simulations, Anatomage, 3D Interactive models, Radiological Anatomy e-Learning, Virtual anatomy resources (KenHub; Visible Body; Complete Anatomy; Netter’s 3D Interactive Anatomy; A.D.A.M. Interactive Anatomy). | |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector, flip chart, 3D modeling software, virtual reality headsets, and online learning management systems. | |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 205: General Pharmacology (2 Unit Core: LH 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Knowledge of general pharmacology is a critical component of medical education and practice. It provides the foundation for effective and safe use of drugs in the treatment of various medical conditions, ultimately improving patient outcomes and quality of life. It also provides a foundation for understanding how drugs work and how they can be used effectively and safely in the treatment of various medical conditions. |
| **Overview:**  General Pharmacology is the study of how drugs interact with the body to produce therapeutic effects. It involves the study of the properties, mechanisms of action, and therapeutic applications of drugs, as well as the adverse effects they may cause. It is a fundamental subject for healthcare professionals, including doctors, nurses, pharmacists, and researchers.  The study of General Pharmacology provides a foundation for understanding how drugs work, their therapeutic applications, and potential adverse effects. It is an essential subject for healthcare professionals who are involved in prescribing, dispensing, and administering medications. |
| **Objectives:**  The objectives of general pharmacology include to:   1. recall appreciate drug mechanisms of action: how drugs interact with the body at the molecular, cellular, and organ levels; 2. identify drug targets: specific receptor targets, receptor molecules process; 3. reproduce mechanism of drug metabolism and elimination: (e.g. how drugs are metabolized and eliminated from the body); 4. identify potential adverse reactions to drugs: rashes, jaundice, anemia; 5. optimize drug therapy: (e.g. describe the pharmacokinetics and pharmacodynamics of drugs) 6. develop new drugs: (e.g. researches on plant herbs and laboratory experiments with animal models). |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. list the basic principles of pharmacology: (e.g. drug absorption, distribution, metabolism, and excretion); 2. classify different type drugs, structures, mechanisms of action, and therapeutic uses: Analgesic, antidiabetic, antimalaria; 3. list the common routes of drug administration: oral, intramuscular, sublingual, topical, enemas 4. recall different types of drug interactions and adverse drug reactions: rashes, jaundice, and anemia, their causes and methods of prevention; 5. explain the principles of drug dosing and the factors that affect drug efficacy and safety; 6. translate critically the efficacy and safety of different drugs based on available evidence; 7. recognize the regulatory frameworks governing the development, approval, and use of drugs: (e.g. NAFDAC and NDLEA), 8. recognize the ethical and legal issues related to the use of drugs: drug abuse and addiction. |
| **Course contents:**  Introduction to pharmacology: definition of pharmacology, its history, and its role in medicine. Drug sources and types: natural and synthetic sources, types of drugs, prescription and over-the-counter drugs. Pharmacokinetics: drugs absorption, distribution, metabolism, and excretion. Pharmacodynamics: mechanism of action, receptor binding, and the effects of drugs on cellular processes. Drug administration: oral, topical, and parenteral, as well as factors that affect drug absorption. Drug metabolism: biotransformation, elimination, and drug interactions. Adverse drug reactions: allergic reactions, drug toxicity, and drug interactions. Pharmacology of specific drug classes: antibiotics, analgesics, antihypertensives, and psychotropic drugs. Therapeutic uses of drugs: therapeutic uses of drugs, treatment of various diseases and disorders. Regulatory aspects of drug development: drug approval, clinical trials, and drug safety monitoring. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 222: Man, and His Environment (2 Unit Core: L= 30: PH)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Studying man and his environment is highly relevant in today's world, as it helps us to understand the complex relationship between humans and the environment around us. It provides insights into how we can promote sustainable development, environmental protection, climate change mitigation and adaptation, sustainable urbanization, social justice, and human health. |
| **Overview:**  Man, and His Environment is a branch of study that explores the relationship between humans and their natural and built environments. It encompasses various disciplines, including anthropology, sociology, psychology, ecology, and environmental science, among others. The study of Man and His Environment is critical because it helps us understand the ways in which humans interact with and influence the natural world, as well as how the environment affects human health and wellbeing.  Some of the key concept include; environmental sustainability, human Ecology, environmental psychology, environmental justice, and sustainable development. The study of Man and His Environment is essential for understanding the complex relationships between humans and the natural and built environments. It helps us develop sustainable practices, policies, and technologies that can promote a healthy and equitable environment for all. |
| **Objectives:**  The objectives of man and his environment include to:   1. list impact of human on the environment: pollution, deforestation, climate change, and loss of biodiversity; 2. promote sustainable development: economic, social, and environmental systems and developing strategies that promote protect the environment; 3. foster environmental stewardship: sense of responsibility and care for the biodiversity, role of humans in preserving the environment; 4. promote social justice: environmental racism, environmental justice, and equitable access to natural resources; 5. develop critical thinking and problem-solving skills: research skills, data analysis skills, and the evidence-based solutions to environmental challenges; and 6. create environmental awareness and education: environmental education, effective communication skills to convey environmental information to a range of audiences. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. realize the interconnectedness of human societies and their environments: (complex relationships between human societies and the natural, built, and social environments) 2. realize the value of biodiversity and ecosystems: (importance of preserving biodiversity); 3. infer the impact of human activities on the environment: (understand the impact of human activities on the environment and strategies to reduce or mitigate the negative effects of human activities on the environment. 4. develop strategies for sustainable development: (help to develop strategies for sustainable development that take into account the social, economic, and environmental factors that influence human well-being); and 5. foster environmental stewardship. |
| **Course contents:**  Introduction to environmental studies: concept of environmental studies, its importance, and its relation to other fields of study such as ecology, biology, chemistry, and geography. Ecosystems: (characteristics of ecosystems, their components, and their interrelationships). Biodiversity: importance of biodiversity and the threats to its existence. Natural Resources: different types of natural resources, their uses, and their depletion. Pollution: different types of pollution, their sources, and their impact on the environment and human health. Climate Change: causes and effects of climate change, the measures taken to mitigate climate change, and the challenges faced in implementing these measures. Environmental Laws and Policies: different types of environmental laws and policies at the local, national, and international levels. Environmental Ethics: ethical and moral considerations related to the environment. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |
| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 223: Systemic Histology (3 Unit Core: L= 30: 45)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Histology plays a crucial role in medical and healthcare-related fields by providing a detailed understanding of the structure and function of tissues and organs, disease processes, and the effects of environmental factors on tissues and organs. It is a critical component in the development of new treatments for diseases which gives researchers the ability to develop new drugs and therapies that target specific tissues and organs. Systemic histology provides a foundation for understanding the underlying causes of diseases and developing effective treatments which can be used to improve patient care and outcomes. |
| **Overview:**  By detailed understanding of the microscopic structure and function of tissues and organs in the body, important for diagnoses and treatments of diseases, as well as understanding the effects of different treatments on tissues and organs could be achieved. By understanding of the changes that occur in tissues and organs during disease processes.  This knowledge can be used to diagnose diseases and develop treatments that target specific tissues and organs. It also provides insights into the effects of environmental factors, such as pollution and radiation, on tissues and organs which can be used to develop strategies to protect and preserve tissues and organs from environmental damage. |
| **Objectives:**  The objectives of systemic histology include to;   1. list microscopic features of different tissues and organs in the human body: lungs, liver, brain; 2. identify different types of cellular components: extracellular matrix, cells and physiological their functions; 3. enumerate the changes that occur in tissues and organs during normal development, aging, and disease processes; 4. realize the use of histology in clinical diagnosis and treatment; and 5. provide students with the knowledge and skills required to engage in research: histopathology, biotechnology, molecular biology. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. identify different types of tissues in the body, (e.g. epithelial, connective, muscular, and nervous tissues); 2. explain the structure and function of the major organ systems, (e.g. cardiovascular, respiratory, digestive, urinary, and reproductive systems); 3. appreciate microscopic structure of different organs, (e.g. cell types, extracellular matrix, and blood supply); 4. identify the histological changes that occur in different diseases and conditions, (e.g. inflammation, infection, and neoplasia); 5. explain various histological techniques used in the preparation and staining of tissue samples (e.g. hematoxylin and eosin staining and immunohistochemistry); and 6. interpret and analyze histological images to make accurate diagnoses and identify abnormalities. |
| **Course Contents:**  Muscular tissue: skeletal, cardiac, and smooth, their structure, function, and location in the body. Nervous tissue: location of the different types of neurons and glial cells in the nervous system. Cardiovascular system: This topic includes the microscopic structure and function of the heart, blood vessels, and blood cells. Respiratory system: microscopic structure of the different components of the respiratory system and their functions. Digestive system: This topic includes the microscopic structure and function of the digestive tract, its accessory organs, and associated glands. Urinary system: microscopic structure and functions of the different components of the urinary system and their functions. Reproductive system: microscopic structure of the male and female reproductive systems and their functions. Endocrine system: microscopic structure and functions pineal, thyroid, pituitary and adrenal glands. Special senses: microscopic structure and functions eye, ear; including organs of balance (equilibrioception), taste, and olfaction. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector, microscopes, microtomes, slides, water-bath, staining reagents, embedding media, public address system and flip chart. |
| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 227: Systemic Physiology (2 Unit Core: L= 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Systemic physiology is relevant in many areas of medicine and health, as it provides a fundamental understanding of how the body's different organ systems function and interact with each other. |
| **Overview:**  Systemic physiology is the study of the integrated functioning of the different organ systems in the body. It involves the examination of how these systems work together to maintain homeostasis, the body's ability to maintain a stable internal environment despite external changes. It covers a wide range of topics, including cardiovascular physiology, respiratory physiology, gastrointestinal physiology, renal physiology, and endocrine physiology. Systemic physiology is relevant in many areas of medicine and health, as it provides a fundamental understanding of how the body's different organ systems function and interact with each other. These include; diagnosis and treatment of diseases, medical research, clinical practice, and disease prevention.  The main objectives of systemic physiology are to understand the normal functioning of the body's different organ systems and how they work together to maintain homeostasis, as well as to understand how these systems are affected by disease, injury, and environmental factors. |
| **Objectives:**  The objectives of systemic physiology include to;   1. list the functions of different organ systems: cardiovascular, respiratory, and digestive systems, and how they work together to maintain homeostasis; 2. describe physiological processes: mechanisms that regulate blood pressure, breathing, digestion, and other physiological processes; 3. enumerate the mechanism of regulation of body systems homeostasis: negative and positive feedback loops; 4. identify the effects of diseases and injuries: how diseases, injuries, and environmental factors affect the functioning of different organ systems, and how these effects can be treated or prevented; and 5. develop new treatments and interventions: research into new treatments and interventions for diseases and conditions that affect the body's different organ systems. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. identify the functions of the different organ systems in the body and how they work together to maintain homeostasis; 2. describe the physiological processes that underlie the functioning of different organ systems, such as the mechanisms that regulate blood pressure, breathing, and digestion; 3. analyze the regulation of body systems, including the mechanisms that maintain homeostasis and the consequences of their disruption; 4. recognize the effects of diseases, injuries, and environmental factors on the functioning of different organ systems and the body as a whole; 5. evaluate the significance of research findings in systemic physiology and their implications for clinical practice and public health; and 6. recall and apply knowledge of systemic physiology to diagnose and treat diseases, evaluate the effectiveness of treatments, and develop new interventions; and 7. interpret and analyze experimental data related to systemic physiology, including measurements of physiological variables and results from physiological experiments. |
| **Course contents:**  Cell physiology: structure and function of cells membranes, as well as the processes that enable cells to carry out their specialized functions, transport process. Homeostasis: mechanisms that maintain a stable internal environment in the body, such as the regulation of blood pressure, temperature, and pH. Excitable Tissues: Structure and functions of nerves, cardiac muscle, smooth muscle and skeletal muscle. Blood Physiology: Composition and functions of blood haemopoiesis. Plasma proteins, coagulation fibrinolysis and platelet functions. Cardiovascular physiology: Heart-cardiac electrophysiology. Properties of cardiac muscle. Cardiac cycle. Cardiac output - measurement and control Haemodynamics. Cardiovascular changes in exercise and haemorrhage. Further consideration of the heat as a pump. Regional circulations coronary, pulmonary, cerebral, coetaneous muscle, sphlanchnic, renal their measurement, special features and control. Auto-regulation mechanism in the heart and peripheral circulation. Respiratory physiology: Functions of upper respiratory tract. Mechanics of respiration including compliance, surfactant, lung volume and capacities; pulmonary gas exchange. Blood gas transport. Pulmonary function tests; Nervous and chemical control of respiration. Response to hypoxia, high altitude and exercise. Artificial respiration. Renal physiology: Macroscopic, microscopic and ultra-structure of the kidney. Elements of renal functions. Glomerular filtration. Concept of clearance. Tubular reabsorption and secretion. Renal blood flow. Body fluid and electrolyte balance. Buffer mechanism and pH regulation. Counter-current system. Micturition. Role of the kidney in body fluid homeostasis. Endocrine physiology: Nature of hypothamo-hypophyseal relationship. Synthesis, storage and release of the neurohypophyseal and adenohypophyseal hormones. Functions of the hypothalamus to include regulation of body temperature, thirst appetite and food intake. Regulation of adenophypophyseal function and higher autonomic control. Functions and control of the secretions of the pituitary, thyroid, parathyroid, pancreas and adrenal glands. Abnormalities of endocrine functions. Normal integration in the control of calcium and glucose metabolism. Reproductive physiology: Fertilization. Structures of ectodermal, mesodermal and endodermal origins and embryogenesis of different organs. Physiologic anatomy of male reproductive system. Spermatogenesis. Male sexual act-nervous co-ordination. Male sexual hormones. Cryptochidism. Physiological anatomy of the female reproductive system. The female sex hormones. Oestrous and menstrual cycles. Physiology of pregnancy, parturition and lactation. Pregnancy tests. Contraception and physiological basis of infertility. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, projectors, animal house, safety gadgets, and flip chart. |
| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 331: Clinical and Applied Anatomy (3 Unit Core: L= 45: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Clinical and applied anatomy is essential to the fields of medicine, surgery, and allied health professions as it provides a foundation of knowledge for diagnoses and treatments of diseases and injuries, interpreting radiological images, designing prosthetics and orthotics, and developing effective rehabilitation programs. By understanding the human body's anatomy, healthcare professionals can provide high-quality care and improve patient outcomes. |
| **Overview:**  Clinical and applied anatomy are two branches of anatomy that focus on the practical applications of anatomical knowledge. Clinical anatomy involves the application of anatomical knowledge to the diagnosis and treatment of medical conditions. It also includes the study of normal and abnormal anatomy, as well as the anatomical basis of medical imaging techniques. It is essential for medical professionals, such as physicians, surgeons, and radiologists, to have a thorough understanding of clinical anatomy to accurately diagnose and treat patients.  While, applied anatomy, also known as functional anatomy, is the study of how anatomical structures relate to their function. It involves the application of anatomical knowledge to fields such as sports science, physical therapy, and ergonomics. Applied anatomy includes the study of biomechanics, kinesiology, and anthropometry. It is important for professionals in these fields to have a solid understanding of applied anatomy to improve performance, prevent injury, and optimize physical function. |
| **Objectives:**  The objectives of clinical and applied anatomy include to;   1. identify the normal and abnormal anatomy of the human body and its variations; 2. identify anatomical structures and their functional relationships in (e.g. human movement and physical function) clinical settings using diagnostic tools such as medical imaging techniques; 3. apply anatomical knowledge in diagnose, treatments of medical conditions, improve performance, prevent injury, and optimize physical function in different settings such as sports, ergonomics, and physical therapy; 4. state the anatomical basis of medical procedures and interventions: laproscopy, appendectomy; 5. list the anatomical organs involve in biomechanics of human movement and the factors that influence it, such as joint range of motion, muscle strength, and flexibility; 6. apply anatomical knowledge in designing interventions and training programs to improve physical function and prevent injury; and 7. state the relationships between anatomy, physiology, and pathology in different contexts. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. distinguish the normal and abnormal anatomy of the human body, including its variations; 2. identify anatomical structures and their functional relationships in clinical settings using diagnostic tools such as medical imaging techniques; 3. apply anatomical knowledge to diagnose and treat medical conditions; 4. explain the anatomical basis of medical procedures and interventions; 5. have a sound understanding of the functional relationships between different organs and systems in the body; and 6. explain the anatomical basis of disease and the impact of pathological changes on organ function. |
| **Course Contents:**  Clinical case studies and applications of the anatomy body system: Skeletal System: skeletal variations and abnormalities. Muscular System: muscles of upper limb, lower limb, and trunk muscles. Nervous System: brain, spinal cord, and nerves, sensory and motor pathways. Cardiovascular System: the heart, blood vessels and lymphatic system including the radiological anatomy and imaging techniques e.g. angiography. Respiratory System: lungs, bronchi, bronchioles and airways. Digestive System: gastrointestinal tract, abdominal muscles and organs. Urinary system: kidneys, ureters, bladder, and urethra. Reproductive system: male and female reproductive systems, hormonal regulation and sexual development. Introduction to Applied Anatomy: Definition and subdivisions of applied anatomy, functional anatomy and kinesiology, musculoskeletal biomechanics. Joint Mechanics: Types of joints and their functions, Joint range of motion and stability, clinical implications of joint mechanics. Muscular Biomechanics: muscle physiology and biomechanics, muscle strength and power, clinical implications of muscular biomechanics. Neuromuscular Control: proprioception and movement coordination, clinical implications of neuromuscular control. Cardiovascular and Respiratory System: clinical implications of cardiovascular and respiratory systems. Sport-specific Anatomy: Anatomy of selected sports and movements (e.g. abduction, circumduction, adduction, eversion, flexion, extension), Biomechanics of sport-specific movements, clinical implications of sport-specific anatomy and biomechanics. Injury Prevention and Rehabilitation: Anatomy of common injuries and their prevention, rehabilitation protocols and strategies, clinical case studies and applications. Ergonomics and Human Factors: Anatomy of human factors and ergonomics, work-related musculoskeletal disorders, clinical implications of ergonomics and human factors. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 321: Basic Histopathology (2 Unit Core: L= 30: PH)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Basic histopathology is crucial to diseases diagnoses and treatments, research and public health. Acquisition of relevant skills in this area enable diagnosis of many diseases, including cancer, infectious diseases, and autoimmune disorders. |
| **Overview:**  Basic histopathology is the study of the microscopic structure of tissues and organs in order to diagnose diseases and determine appropriate treatment options. It is a fundamental component of modern medicine, providing critical insights into the mechanisms of disease, as well as informing the development of new treatments and therapies.  It covers the microscopic changes that occur in different tissues and organs in response to disease or injury. It involves sample preparation, microscopic examination, identification of abnormalities, and interpretation of findings. This may involve the use of other diagnostic tests, such as immunohistochemistry, to help identify specific markers or characteristics associated with particular diseases. It has a wide range of medical fields, including pathology, oncology, and veterinary medicine. |
| **Objectives:**  The objectives of basic histopathology include to;   1. describe the histopathologic basis of diseases condition: Ulcerative colitis, Crohn's disease, Uterine fibroids, Cancer, Infections; 2. provide prognosis and guide treatment decisions of diseases: Ulcerative colitis, Crohn's disease, Uterine fibroids, Cancer, Infections; 3. identify characteristics of disease abnormalities: (based structural changes and abnormalities that may be indicative of disease or injury, even before clinical symptoms are present); 4. monitor progression of disease: (which can help guide treatment decisions and evaluate treatment efficacy); 5. provide insights into the cellular and molecular changes that occur in response to disease or treatment; and 6. explain the underlying mechanisms of diseases and the associated structural changes seen in tissues. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. describe and carry out the basic principles of tissue preparation: (fixation, processing, embedding, and sectioning techniques); 2. list the different cell types that make up tissues (e.g. squamous, columnar, nervous and muscle cells); 3. identify pathological changes: necrosis, apoptosis, karyolitic cells; 4. perform tissue processing: (e.g. fixation, embedding, sectioning, and staining); 5. use microscopes: (e.g. different types of microscopes, including light microscopes and electron microscopes, to examine tissue samples and identify pathological changes; 6. interpret findings: (e.g. histopathological examinations (cancerous, necrotic, apoptotic) and identify the structural changes that are indicative of disease or injury); 7. describe basic diagnostic techniques: (e.g. immunohistochemistry, histochemistry, which can help identify specific markers or characteristics associated with particular diseases); and 8. explain findings to other healthcare professionals in a clear and concise manner. |
| **Course Content:**  Introduction to histopathology: history of histopathology, basic principles, and techniques used in histopathology. Cell structure and function: basic structure and function of cells, including organelles, and the various types of tissues that make up organs. Inflammation and repair: different types of inflammation, the process of tissue repair, and the various factors that can affect tissue repair.  Neoplasia: different types of tumors, including benign and malignant tumors, the various factors that contribute to the development of cancer, and the process of tumor progression. Infectious diseases: different types of infectious diseases, including bacterial, viral, and fungal infections, and the mechanisms by which they cause disease. Immunology: basic principles of immunology, including the different components of the immune system, and how the immune system responds to disease.  Laboratory techniques: different laboratory techniques used in histopathology, including staining, microscopy, and immunohistochemistry. Quality control and assurance: various aspects of quality control and assurance in histopathology, including the importance of maintaining accuracy and precision in laboratory testing. Special topics: specific diseases or organ systems, and may cover advanced techniques such as electron microscopy or molecular pathology. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector, and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 325: Comparative Anatomy (2 Unit Core: L 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Understanding human evolution is important for medical science, animal behavior, conservation biology, and education. By studying the similarities and differences in the anatomy of different organisms, scientists can gain insight into a range of biological phenomena that can be applied to various fields of study. |
| **Overview:**  Comparative anatomy is the study of the similarities and differences in the structure and function of different species. Its main objective is to understand the evolution of biological systems and the relationships between different species.  The major expectations from the graduates of comparative anatomy are to have a deep understanding of the principles of evolution, the ability to identify anatomical structures and compare them, proficiency in dissection techniques and laboratory skills, the ability to analyze data and apply their knowledge to real-world problems, and effective communication skills. These skills are essential for pursuing a wide range of careers in the biological sciences, including research, education, and conservation. |
| **Objectives:**  The objectives of comparative anatomy include to;   1. compare and contrast the anatomy of different species: pieces, amphibian, reptiles, aves, and mammals; 2. describe the evolution of biological systems: divergent, coevolution, parallel evolution, and convergent evolution; 3. infer the function of specific anatomical structures and the mechanisms that underlie their evolution; 4. list different types of evolution and adaptive responses of organisms to different environments and ecological pressures: structural adaptation, behavioural adaptation, physiological adaptation, co-adaptation; 5. classify species into different groups based on shared anatomical characteristics: pieces, amphibian, reptiles, aves, and mammals; and 6. explain comparative embryology and developmental biology: embryogenesis and ontogenesis; 7. explain paleontology: to reconstruct the anatomy and physiology of extinct species and understand their evolutionary history. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. explain basic structure and function of mammalian body systems: skeletal, muscular, respiratory, circulatory, digestive, and nervous systems; 2. distinguish the anatomical structures of different species, and understand the evolutionary relationships between them; 3. explain the role of adaptations on different mammalian species to their environments, such as those related to locomotion, feeding, and reproduction; 4. explain the principles of phylogenetics and how they are used to reconstruct the evolutionary history of mammals; 5. develop skills in anatomical observation, dissection, and comparative analysis; 6. explain the importance of comparative mammalian anatomy in fields such as evolutionary biology, ecology, and veterinary medicine; and 7. apply the knowledge of comparative mammalian anatomy in relevant area: diagnosis and treatment of diseases in veterinary medicine. |
| **Course contents:**  Introduction to comparative anatomy: an overview of the goals and objectives of comparative anatomy, the history of the field, and the basic concepts and terminology used in the study of comparative anatomy. Introduction to Mammals: Characteristics, classification, and evolution of mammals. Comparative skeletal anatomy: different types of skeletal systems found in different organisms, including exoskeletons, endoskeletons, and hydrostatic skeletons, including the structure and function of bones, cartilage, and other connective tissues. Comparative muscular anatomy: different types of muscles found in different organisms, including skeletal, smooth, and cardiac muscles, including the structure and function of muscle fibers, tendons, and ligaments. Comparative circulatory anatomy: different types of circulatory systems found in different organisms, including open and closed circulatory systems, including the structure and function of the heart, blood vessels, and blood cells. Comparative respiratory anatomy: different types of respiratory systems found in different organisms, including gills, lungs, and tracheal systems. It may also include structure and function of the respiratory organs and the mechanisms of gas exchange. Comparative digestive anatomy: different types of digestive systems found in different organisms, including simple and complex digestive systems. It may also cover the structure and function of the digestive organs and the mechanisms of nutrient absorption. Comparative reproductive anatomy: different types of reproductive systems found in different organisms, including asexual and sexual reproduction. It may also cover the structure and function of the reproductive organs and the mechanisms of gamete production and fertilization. Comparative nervous system anatomy: different types of nervous systems found in different organisms, including centralized and decentralized nervous systems. It may also cover the structure and function of neurons, synapses, and sensory organs. Comparative endocrine system anatomy: different types of endocrine systems found in different organisms, including hormonal and non-hormonal signaling systems. It may also cover the structure and function of endocrine glands and the mechanisms of hormone production and signaling. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 329: Neurophysiology (2 Unit Core: L 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Neurophysiology is an important field of study for understanding the complex workings of the nervous system and how it controls our thoughts, behaviors, and bodily functions. |
| **Overview:**  Neurophysiology is the study of the functioning of the nervous system, including the brain, spinal cord, and peripheral nerves. It is a subfield of neuroscience that focuses on the electrical and chemical activities that occur in the nervous system, as well as the structural and functional aspects of the cells and tissues that make up the nervous system. It involves the study of various types of brain waves and their functions, such as alpha waves, beta waves, theta waves, and delta waves. These brain waves are important for understanding different states of consciousness, such as sleep, wakefulness, and meditation.  Neurophysiologists study the behavior of nerve cells, or neurons, as well as the connections between neurons, known as synapses. They investigate the ways in which neurons communicate with each other and with other cells in the body, including muscle cells and gland cells. Some of the techniques used in neurophysiology include electroencephalography (EEG), which measures electrical activity in the brain, and magnetoencephalography (MEG), which measures magnetic fields generated by the brain. Other techniques include single-cell recording, in which the activity of individual neurons is measured, and functional magnetic resonance imaging (fMRI), which measures changes in blood flow in the brain to detect areas of neural activity. |
| **Objectives:**  The objectives of neurophysiology include to:   1. list the fundamental mechanisms that underlie the functioning of the nervous system at various levels: neurons and neural networks and systems; 2. investigate the electrical and chemical signaling processes that occur within the nervous system: generation and propagation of action potentials, synaptic transmission, and neuromodulation; 3. list the component of nervous system processes and integrates sensory information: vision, hearing, touch, and taste, and how it controls motor functions, such as movement and speech; 4. identify the role of the nervous system in higher cognitive processes: attention, memory, language, and decision-making; 5. develop new techniques and technologies for studying the nervous system: advanced imaging techniques, computational modeling, and optogenetics; and 6. apply the knowledge gained from neurophysiological research to develop new therapies and treatments for neurological disorders: epilepsy, Parkinson's disease, and stroke. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. explain the basic principles of neurophysiology: the generation and propagation of action potentials, synaptic transmission, and the role of glial cells in the nervous system. 2. analyze and interpret neural circuits and systems: sensory and motor pathways, and the neural basis of behavior. 3. explain the neural basis of cognition: attention, memory, language, and decision-making. 4. operate advanced techniques and technologies for studying the nervous system: electrophysiology, imaging, and computational modeling. 5. translate critical thinking and problem-solving skills through analyzing and interpreting data from neurophysiological experiments and applying this knowledge to real-world problems. 6. explain neurological disorders: epilepsy, Parkinson's disease, and stroke, and the current treatments available for these conditions. |
| **Course contents:**  General arrangements of the nervous system. Nerve generation and conduction of impulses. Synapses and synaptic transmission. Peripheral nervous system -the reflex arc and general properties of reflexes. Receptors. Muscle: structure, excitation, theories of contraction. Introduction to the central nervous system. Membrane potentials, Nerve impulse and its physiological properties; Synaptic transmission. Mechanism of force production; functional adaptations of muscles. Functional organization of CNS, autonomic neurotransmitter and autonomic effects. The human brain —brain stem, basal ganglia, thalamus and cerebella. Cerebrospinal fluid and the blood\brain barrier. Electrophysiology of the cerebral cortex the electroencephalogram alertness and sleep. Postural regulation and postural reflexes. Physiology of hearing, vision, taste and smell. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-GST 401: Character Building, Professionalism and Team Work in Healthcare (2 Unit Core: L= 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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.  In addition, the students will be exposed to communication and counselling skills that are consistent with the various cultural milieus of practice that they are likely to encounter. Furthermore, it will enhance the collaborative nature of the work they would be involved in post-qualification. 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 Character Building, Professionalism and Team Work in Healthcare include to;   1. describe various types of leadership styles applicable in clinical and academic settings. 2. equip students with various skills of mentoring in clinical and academic settings. 3. enumerate the characteristics of a successful team in achieving team objectives. 4. describe the roles of professionalism in various fields of healthcare delivery. 5. describe the principles and practice of psychology in healthcare settings. 6. describe the principles of effective communication for the patients, healthcare team and the general public. 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. identify the risk factors and preventive strategies for substance abuse. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. identify at least three common types of leadership styles with two 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. 7. conduct three counselling sessions in three recognised clinical scenarios. 8. to demonstrate effective communication skills in dealing with clients, and the general public in recognised clinical scenario. 9. enumerate four forms of character traits each for three personality types. 10. mention four ethical challenges and four appropriate ethical principles to address them in a clinical practice and research. 11. Enumerate four preventive strategies to address three forms of drug abuse. |
| **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 requirements:** A lecture hall with a minimum 50 students seating capacity, projectors, animal house, safety gadgets, and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 431: Histological Methods and Animals Handling (3 Unit Core: L= 30: PH 45)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Histological methods and animal handling are critical components of biological research, particularly in the fields of anatomy, physiology, and pathology. They are essential tools for advancing our understanding of biology and improving human and animal health. By providing insights into the structure and function of tissues and organs, these techniques help researchers to identify new treatments for diseases, develop safer and more effective drugs, and improve our understanding of the natural world. |
| **Overview:**  Histological methods and animal handling are important aspects of research in the biological sciences. Histological methods are used to prepare, stain, and examine tissues for microscopic study. Animal handling is the process of caring for and manipulating animals in a research setting.  Histological Methods involves fixation, embedding, sectioning, and staining of tissues to visualize cellular structures and subcellular components using a light microscopy or electron microscopes, use of special techniques (immunohistochemistry, and In situ hybridization to detect specific proteins in tissues and RNA or DNA and use of microdissection to isolate specific regions or cells from tissues. Animal Handling involves adhering to ethics and regulations to maintain health and safety of environment, animals and researchers. It also involves animal care and husbandry, (housing, nutrition, and care for animals), Animal Manipulation (Anesthesia and analgesia), Surgical techniques, Behavioral experiments, and data collection (record keeping and analysis). |
| **Objectives:**  The objectives of histological methods and animals handling include to;   1. identify stages of tissue preparation; 2. analyze tissues and organs structures under microscope; 3. provide welfare of animals: housing, food, and water, monitoring the animals' health, and minimizing any pain or distress; 4. conduct research in accordance with regulatory guidelines; and 5. identify source of data and ensure that accurate and reliable data is collected from animal experiments (accurate record-keeping, and appropriate statistical analysis of data). |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. identify stage involved in tissue samples preparation for analysis under the microscope: fixation, embedding, sectioning, staining, and other steps; 2. analyze tissue samples under the microscope: cell size, shape, and density; 3. explain the structure and function of different tissues and organs in the body; 4. list the requirements of animal welfare: housing, food, and water; 5. recognize the needs of ethical considerations in animal research: ethical approvals, number, potential harm for the animals in research; and 6. explain handling animals in research: administration drugs, sacrifice, treatments, and collect accurate data from animal experiments. |
| **Course contents:**  Introduction to Histology: Overview of histology, including the basic principles, techniques, and applications of histology. Tissue Preparation Techniques: Different techniques used to prepare tissue samples for analysis, including fixation, embedding, sectioning, and staining. Microscopy: Basics of light microscopy and electron microscopy, including types of microscopes, image formation, and interpretation. Histological Stains: Different types of histological stains, including hematoxylin and eosin (H&E), Masson's trichrome, Periodic Acid-Schiff (PAS), and others. Identification of Cells and Tissues: Identification of different cell types and tissues, including epithelial, connective, muscle, and nervous tissue. Histopathology: Overview of histopathology, including the study of disease processes and the use of histology in diagnosis and treatment. Introduction to Animal Handling: Overview of animal handling, including the basic principles, techniques, and applications of animal handling. Animal Welfare: The importance of animal welfare in research, including the principles of the 3Rs (replacement, reduction, refinement), and ethical considerations involved in animal research. Animal Housing and Care: Different housing and care options for laboratory animals, including environmental enrichment, feeding, and watering. Animal Behavior: Overview of animal behavior, including methods for observing and recording animal behavior. Animal Handling Techniques: Different techniques for handling laboratory animals, including restraint, injection, and blood collection. Anesthesia and Analgesia: Introduction to anesthesia and analgesia in laboratory animals, including the principles of anesthesia and analgesia, and common anesthetic agents and techniques. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, projectors, animal house, safety gadgets, and flip chart. |
| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 433: Cell Biology and Tissue Culture (3 Unit Core: L 45: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Cell biology and tissue culture forms a strong force to reckon with the field of science and medicine, biotechnology, cancer research, genetics and regenerative medicine. Graduates of cell biology and tissue culture are expected to have a solid foundation in the principles and applications of these fields, as well as the skills necessary to pursue careers in a range of fields related to biotechnology, medical research, and other areas of science. They should be able to use their knowledge and skills to design and conduct experiments, analyze and interpret data, and communicate their findings effectively |
| **Overview:**  Cell Biology and Tissue Culture is a field of study that involves the study of cells and the cultivation of cells and tissues in vitro. It involves in the study of cells, their structure, function, and behavior, as well as the ability to grow and manipulate cells in a controlled environment.  Cell biology focuses on the study of the fundamental unit of life, the cell. It involves the study of the structure and function of different cell components such as the nucleus, mitochondria, cytoplasm, and cell membrane, among others. It also involves the study of cell communication, cell division, and cell differentiation. Tissue culture, on the other hand, involves the growth and manipulation of cells in a laboratory setting. It involves the ability to grow and manipulate cells in a controlled environment, using specialized techniques to provide the necessary nutrients and conditions required for cell growth. Tissue culture can be used to study cell behavior under different conditions, such as in response to drugs, toxins, or environmental changes. |
| **Objectives:**  The objectives of cell biology and tissue culture include to:   1. explain the basic structure and function of cells: structure and function of cells, organelles and biochemical processes; 2. describe the principles of cell communication: mechanisms of cell signaling and communication; 3. explain cell growth, division, and differentiation: (e.g. how cells grow and divide, and how they differentiate into different cell types; 4. list the techniques used in tissue culture: mechanical method, enzymatic method; 5. explain the application of cell biology and tissue culture: biotechnology, medicine, agriculture, and industry; and 6. use laboratory equipment: cell culture incubators, biosafety cabinets, plates, flasks, pipettes, vials, tubes and filtration units; and 7. analyze and interpret data: cell number, cell density, cell shape and size. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. identify the different cellular organelles: nucleus, mitochondria and cytoplasm; 2. explain the mechanisms of cell signaling and communication, including the different signaling pathways and the molecules involved; 3. describe the process of cell growth, division, and differentiation, including the cell cycle and the various factors that regulate these processes. 4. list laboratory techniques used in cell biology and tissue culture: cell culture, microscopy, cell staining, and DNA analysis; 5. list the applications of cell biology and tissue culture in different fields: biotechnology, medicine and industry; 6. analyze and interpret scientific data, including laboratory results and research findings; 7. translate critical thinking through laboratory work and analysis of scientific data; and 8. explain scientific information effectively through written reports, oral presentations, and scientific papers. |
| **Course Content:**  Introduction to cell biology: The course may begin with an overview of cell biology, including the different types of cells, cell structures and functions, and the history of cell biology. Cell membrane and transport: Students will learn about the cell membrane and its structure, function, and role in transport of molecules into and out of the cell. Cell communication: The course will cover the different modes of cell communication, including chemical signals and cell signaling pathways. Cell cycle and division: Students will learn about the stages of the cell cycle, including interphase, mitosis, and cytokinesis, and the regulatory molecules that control these processes. Genetics and gene expression: The course may cover the principles of genetics, including DNA structure, replication, transcription, and translation, and how gene expression is regulated in cells. Introduction to tissue culture: The course will introduce the principles and techniques of tissue culture, including the maintenance and growth of cells in vitro, cell isolation, and cell culture media. Microscopy and staining techniques: Students will learn about different microscopy techniques used to visualize cells and tissues, including light microscopy, electron microscopy, and immunofluorescence staining. Cell differentiation and stem cells: The course may cover the different mechanisms of cell differentiation, including stem cell biology and its applications in tissue engineering. Cellular metabolism: Students will learn about the metabolic processes that occur in cells, including glycolysis, Krebs cycle, and oxidative phosphorylation. Cellular responses to stress: The course may cover the different cellular responses to stress, including apoptosis, autophagy, and cellular senescence. Applications of cell biology and tissue culture: The course will introduce the different applications of cell biology and tissue culture in various fields, including biotechnology, regenerative medicine, and drug discovery. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 435: Forensic Anatomy (3 Unit Core: L 45: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. The use of anatomical knowledge to resolve medico-legal case has been in existence in the human history. Forensic anatomy is a subfield of anatomy that has many practical applications in law enforcement and the justice system for investigations and the criminal justice system. It has significant role in forensic medicine, which encompasses the medical aspects of legal cases, including injury analysis, identification of human remains, and assessment of medical evidence. |
| **Overview:**  Forensic anatomy is a subfield of anatomy that deals with the application of anatomical knowledge and techniques to assist in legal investigations and court cases. Forensic science is a multidisciplinary field that involves the application of scientific methods and techniques to solve criminal cases. The course content of forensic sciences includes various subjects from different scientific fields.  It involves the study of the structure and function of the human body as it relates to injury, trauma, and criminal activities. Identification of human remains: Forensic anatomists can use their knowledge of skeletal and dental anatomy to identify human remains, especially in cases where the body has been badly decomposed or dismembered. Investigation of injuries: Forensic anatomists can help to determine the cause of injuries sustained by victims or suspects in criminal cases. This may involve the analysis of wounds, bruises, and fractures, as well as the examination of medical records and other evidence. Examination of crime scenes: Forensic anatomists may be called upon to examine crime scenes for evidence, such as blood spatter patterns, bullet trajectories, and other physical clues that may help to solve a crime. Expert testimony: Forensic anatomists may be asked to provide expert testimony in court cases, to explain complex anatomical concepts and to help judges and juries understand the evidence. Research: Forensic anatomy also involves research into new techniques and technologies that can improve the accuracy and reliability of forensic investigations. |
| **Objectives:**  The objectives of forensic anatomy include to:   1. identify human remains: bones, age, sex, stature, and race; 2. explain cause and manner of death: suicide, homicide, and patricide; 3. investigate of injuries: type laceration, bruises and contusion; 4. explain the degree of the injury: mild, moderate or severe; 5. estimate the time of death or infliction: days, weeks or months; 6. interpret of medical records: autopsy reports, X-rays, and other diagnostic tests; 7. provide expert testimony: court reports, and evidences; and 8. conduct research: causes of death and injury, new techniques for identifying human remains, and the evaluation of the efficacy of forensic methods. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. identify human remains and injuries based on their anatomical features: sex, race and age; 2. analyze human remains and injuries based on their anatomical features: sex, race and age; 3. explain techniques used in forensic investigations: DNA analysis, fingerprinting, odontology, X-rays and CT scans; 4. present testimony to court: court reports, and evidences, handling human remains and injuries; 5. explain the cause of injuries, estimated time of death; 6. interpret medical reports of the cause of death: suicide, natural, homicide; 7. list the equipment and tools used in forensic investigations: microscopes and scales; 8. develop research skills by conducting independent research projects and learning how to critically evaluate scientific literature. |
| **Course contents:**  Introduction to forensic anatomy: Definition, scope, and history of forensic anatomy, legal aspects, ethics and professionalism in forensic anatomy. Human identification: Methods of identifying human remains such as DNA analysis, facial reconstruction, and odontology. Skeletal anatomy: Identification of human bones, estimation of age, sex, stature, and race from bones, identification of trauma, and personal identification. Soft tissue anatomy: Identification of wounds, bruises, and other injuries, estimation of time of death, and interpretation of medical records. Ballistics and firearms: Identification of the type of weapon used in a crime, analysis of bullet trajectories, and interpretation of gunshot wounds. Entomology: Study of insect evidence such as the post-mortem interval, species identification, and estimation of the time of death. Anthropometry and facial reconstruction: Methods of measurement and analysis of the human body, and techniques for facial reconstruction. Expert testimony and report writing: The preparation of forensic anatomy reports, the presentation of evidence in court, and the role of forensic anatomists as expert witnesses. Special topics: Such as examination of sexual offences, bloodstain pattern analysis, toxicology, and forensic imaging.  **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 423: Nutritional Science (2 Unit Core: L 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. |
| **Overview:**  Nutritional science is the study of the biological, physiological, and biochemical processes involved in the utilization of food and nutrients by the human body. It involves the study of how different nutrients interact with the body and how dietary patterns can affect health. It studies the role of macronutrients, such as carbohydrates, proteins, and fats, in maintaining optimal health. It examines the way these nutrients are metabolized and utilized by the body and how they affect various physiological functions. It also focuses on the role of micronutrients, such as vitamins and minerals, in maintaining health.  It examines how these nutrients are absorbed and utilized by the body and how their deficiencies can lead to disease. It investigates the relationship between dietary patterns and health outcomes. It explores the effects of various dietary patterns, such as the mediterranean diet or the DASH diet, on disease prevention and management. It involves the study of nutritional epidemiology, which investigates the relationships between dietary patterns, nutrient intake, and disease incidence in populations. It also studies of food science, which involves the chemistry and physical properties of food and the development of food products and processing methods. |
| **Objectives:**  The objectives of nutritional science include to:   1. list the role of different nutrients in maintaining optimal health: carbohydrates, proteins, fats, vitamins, and minerals; 2. investigate the relationship between dietary patterns and health outcomes: cardiovascular disease, diabetes, and cancer; 3. develop evidence-based dietary guidelines that can help individuals and populations make informed decisions about their diets; 4. identify nutrient deficiencies and develop strategies for addressing them: food fortification and supplementation; and 5. develop new food products and processing methods that can improve the nutritional quality and safety of the food supply. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. explain the functions of different nutrients in the body: carbohydrates, proteins, fats, vitamins, and minerals; 2. identify common nutrient deficiencies, their causes, and strategies for addressing them; 3. explain the relationship between dietary patterns and chronic diseases, such as cardiovascular disease, diabetes, and cancer; 4. analyze dietary patterns and evaluate their nutritional adequacy and potential health effects; 5. develop evidence-based dietary recommendations based on the latest scientific research; 6. explain the principles of food safety and quality, including the causes and prevention of food borne illness; and 7. apply their nutritional knowledge to promote optimal nutrition in clinical and community settings: hospitals, clinics, and public health programs. |
| **Course contents:**  Basic nutrition: introduction to basic nutrition concepts, including the six essential nutrients, digestion and absorption, and energy metabolism. Macronutrients: role of macronutrients, (i.e. carbohydrates, proteins, and fats), in maintaining optimal health. This includes studying their metabolism, functions, sources, and recommended intake. Micronutrients: role of micronutrients, including vitamins and minerals, in maintaining optimal health. This includes studying their functions, sources, recommended intake, and deficiency symptoms. Dietary patterns: relationship between dietary patterns and health outcomes, including the effects of various dietary patterns on chronic diseases, such as cardiovascular disease, diabetes, and cancer. Nutritional epidemiology: the principles of nutritional epidemiology, including the design and interpretation of studies that investigate the relationship between diet and health. Food science: introduction to food science, which covers the chemistry and physical properties of food, as well as food processing and preservation methods. Nutritional assessment: methods for assessing nutritional status, including anthropometric, biochemical, and dietary assessment methods. Nutrition in different life stages: nutritional requirements and recommendations for different life stages, including infants, children, adolescents, adults, and elderly individuals. Nutrition and disease: relationship between nutrition and various diseases, including obesity, diabetes, cardiovascular disease, and cancer. Public health nutrition: principles and strategies for promoting optimal nutrition and preventing chronic diseases in populations, including policy and program development, implementation, and evaluation. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 434: Teratology (3 Unit Core: L 45: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. The study of teratology is important in understanding the causes of birth defects and developing strategies to prevent them. This can include identifying and avoiding teratogenic substances, providing appropriate prenatal care, and developing interventions to support fetal development. |
| **Overview:**  Teratology is the study of abnormal development of embryos or fetuses, leading to structural or functional birth defects. It is a branch of developmental biology and can include the study of genetic and environmental factors that can affect fetal development.  Teratogens are substances or agents that can cause birth defects. These can include drugs, alcohol, environmental toxins, infectious agents, and nutritional deficiencies. The effects of teratogens on fetal development can vary depending on the timing, duration, and dose of exposure, as well as the genetic susceptibility of the fetus. Teratologists can work in a variety of fields, including research, clinical practice, and public health. They may work in collaboration with obstetricians, pediatricians, geneticists, toxicologists, and other healthcare professionals to provide comprehensive care for women and infants at risk for or affected by birth defects. |
| **Objectives:**  The objectives of teratology include to;   1. explain the normal processes of embryonic and fetal development: zygote, morula, blastula, bilaminar and trilaminar embryonic disc; 2. identify and characterize teratogenic agents: drugs, chemical, microorganism; 3. explain the developmental abnormalities or birth defects and the mechanisms they exert their effects: spina bifida, cleft palate, amelia; 4. explain the timing, dose, and duration of teratogenic exposure: critical periods of fetal development when exposure to teratogenic agents can have the greatest impact and to identify safe exposure levels for pregnant women and their fetuses); 5. develop strategies for preventing or mitigating the effects of teratogenic exposure: interventions, strategies, prenatal screening and genetic counseling, public health policies and education programs, and medical treatments to prevent or minimize the risk of teratogenic exposure); and 6. provide care for infants and children affected by developmental abnormalities: diagnosis, treatment, and long-term management of the condition. |
| **Learning Outcomes:**  At the end of the course students should be able to;   1. describe the normal processes of embryonic and fetal development: (formation of organ systems, and identify the key stages) and factors that can influence fetal development; 2. identify teratogenic agents: (drugs, chemicals, environmental factors, and infections); 3. describe their mechanisms of action and effects on fetal development; 4. describe the principles and methods of teratogenicity testing: (in vitro and in vivo methods), and evaluate the strengths and limitations of different testing approaches; 5. explain the principles of risk assessment and management; 6. identify potential teratogenic risks and develop strategies to prevent or minimize exposure and manage the risks; 7. describe the principles and methods of prenatal screening and genetic counseling: genetic testing, and evaluate the benefits and limitations of these approaches; and 8. describe the principles and methods of diagnosis and management of developmental abnormalities: (medical and surgical interventions), and evaluate the outcomes and challenges of these approaches. |
| **Course contents:**  Introduction to teratology: Definition, history, scope, and significance of teratology. Embryonic and fetal development: Normal processes of embryonic and fetal development, including the formation of organ systems, critical periods of development, and factors that can influence fetal development. Genetic and environmental factors in teratogenesis: Genetic and environmental factors that can cause developmental abnormalities, including mutations, chromosomal abnormalities, maternal infections, drugs, chemicals, and radiation. Mechanisms of teratogenesis: Mechanisms by which teratogenic agents exert their effects, including interference with cellular processes, disruption of tissue organization, and induction of apoptosis. Teratogenicity testing: Principles and methods of teratogenicity testing, including in vitro and in vivo methods, and the strengths and limitations of different testing approaches. Risk assessment and management: Principles of risk assessment and management, including identifying potential teratogenic risks, developing strategies to prevent or minimize exposure, and managing the risks. Prenatal screening and genetic counseling: Principles and methods of prenatal screening and genetic counseling, including genetic testing, and the benefits and limitations of these approaches. Diagnosis and management of developmental abnormalities: Principles and methods of diagnosis and management of developmental abnormalities, including medical and surgical interventions, and the outcomes and challenges of these approaches. Prevention of developmental abnormalities: Strategies to prevent developmental abnormalities, including public health policies, education programs, and medical treatments. Ethical and legal issues in teratology: Ethical and legal considerations related to teratology, including informed consent, confidentiality, and reproductive rights. |
| **Minimum Academic standards requirements:**  A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |

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| **Institution:** Bayero University, Kano |
| **Faculty:** Basic Medical Sciences |
| **Department:** Anatomy |
| **Programme:** B.Sc. Human Anatomy |
| **BUK-ANA 424: Anatomical Data Management (2 Unit Core: L 30: PH 0)** |
| **Senate approved relevance to mission and strategic goals of the university:**  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 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. Anatomical data management is essential for many fields, including biomedical research, clinical practice, medical education, and medical imaging. Effective management of anatomical data enables researchers, clinicians, and educators to access and analyze high-quality anatomical data, facilitating discovery and innovation in medicine and healthcare. |
| **Overview:**  Anatomical data management involves the storage, processing, and retrieval of information related to the structure and function of living organisms. This information can include data on the organs, tissues, cells, and systems that make up an organism, as well as information on their physiological processes, biochemical pathways, and genetic makeup.  Anatomical data management is essential in a variety of fields, including biology, medicine, veterinary science, and agriculture. It is used to store and organize large amounts of data, allowing researchers to access and analyze information more efficiently. It also helps to ensure the accuracy and consistency of data, and enables collaboration between researchers in different locations. There are various tools and techniques used for anatomical data management, including databases, data mining, and image analysis software. These tools can be used to store, retrieve, and analyze data in various formats, including text, images, and videos. One of the main challenges of anatomical data management is the sheer volume of data that needs to be processed and analyzed. Advances in technology, such as machine learning and artificial intelligence, are helping to address this challenge by enabling researchers to automate certain tasks and analyze large datasets more efficiently. |
| **Objectives:**  The objectives of anatomical data management include to;   1. evaluate anatomical data: organization, search, and access to authorized users; 2. reproduce accurate anatomical data and up-to-dates for research, clinical applications, education, and other purposes; 3. explain the laws and regulations governing data privacy, confidentiality; 4. establish and adhere to standard formats and terminologies for anatomical data, ensuring consistency, comparability, and interoperability across different systems and institutions; 5. integrate anatomical data with other relevant datasets, such as clinical and imaging data, to enable more comprehensive analyses and applications; and 6. enable collaboration among researchers and educators, sharing anatomical data and resources to facilitate research, education, and innovation. |
| **Learning Outcomes:**  At the end of the course students should be able to:   1. enumerate the various sources of anatomical data, (e.g. textbooks, atlases, digital images, and databases; 2. reproduce, acquire, organize, and manage anatomical data in a structured and systematic manner; 3. realize the importance of standardization in anatomical data management and the ability to apply standard formats, terminologies, and data models to anatomical data; 4. analyze and interpret anatomical data using statistical and computational tools, including image analysis software and machine learning algorithms; 5. outline the importance of anatomical data security, privacy and data protection measures; 6. explain the importance of collaboration with other researchers and educators, sharing anatomical data and resources in a secure and ethical manner. 7. explain the ethical and legal issues related to anatomical data management, including informed consent, confidentiality, and data protection regulations. |
| **Course contents:**  Introduction to anatomical data management: Overview of the importance of anatomical data management, and the role of digital technologies in anatomical research, education, and clinical practice. Anatomical data sources: Review of the various sources of anatomical data: textbooks, atlases, digital images, and databases. Data acquisition and organization: Principles of data acquisition, organization, and management: data cleaning, data normalization, and data transformation. Data standardization: overview of standardization in anatomical data management, standard formats, terminologies, and data models. Anatomical imaging: Introduction to different imaging modalities used in anatomical research and clinical practice, CT, MRI, and ultrasound. Image analysis: Techniques for image analysis and processing, including segmentation, registration, and feature extraction. Statistical analysis: Overview of statistical analysis techniques used in anatomical research, including regression analysis, correlation analysis, and analysis of variance. Machine learning: Introduction to machine learning techniques applied in anatomical data management, including supervised and unsupervised learning, classification, and clustering. Data security and privacy: Overview of data security and privacy issues in anatomical data management, including HIPAA (Health Insurance Portability and Accountability Act) regulations, GDPR (General Data Protection Regulation), and data anonymization techniques. Collaborative data sharing: Principles of collaborative data sharing in anatomical data management, including data sharing platforms, data sharing policies, and ethical considerations. Ethical and legal considerations: Overview of ethical and legal issues in anatomical data management, including informed consent, confidentiality, and data protection regulations. |
| **Minimum Academic standards requirements:** A lecture hall with a minimum 50 students seating capacity, a projector and flip chart. |