**Bayero University, Kano**

**College of Health Science**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **100 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-MTH 101 | Mathematics for Health Sciences | 3 | C | 45 | - |
| **TOTAL** | | **3** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **200 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit** | **Status** | **LH** | **PH** |
| BUK-PIO 201 | Gastrointestinal tract and Renal Physiology | 2 | C | 30 | - |
| BUK-EHS 202 | Water, Wastewater, and Health | 2 | C | 30 |  |
| **TOTAL** | | **4** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **300 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit (s)** | **Status** | **LH** | **PH** |
| BUK-EHS 301 | Health and Sustainability | 2 | C | 30 |  |
| BUK-EHS 302 | Introduction to Technical Communication in Environmental Health | 2 | C | 30 |  |
| BUK-EHS 303 | Environmental Health in Media | 2 | C | 30 |  |
| BUK-EHS 304 | Occupational Sampling and Analysis | 2 | C | 15 | 45 |
| BUK-EHS 306 | Ecology of Environmentally Transmitted Microbiological Hazards | 2 | C | 30 |  |
| BUK-EHS 307 | Geographic Information Systems (GIS) in Environmental Health Science | 2 | C | 15 | 45 |
|  | **TOTAL** | **12** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Unit (s)** | **Status** | **LH** | **PH** |
| BUK-EHS 401 | Global Environmental Change and Public Health | 2 | C | 30 |  |
| BUK-GST 401 | Character Building, Professionalism and Team Work in Healthcare | 2 | C | 30 |  |
| BUK-EHS 402 | Risk and Vulnerability in Environmental Health | 2 | C | 30 |  |
| BUK-EHS 403 | Pharmacogenetics and Toxicogenomics in Environmental Health | 3 | C | 30 | 45 |
| BUK-EHS 404 | Environmental Change and Infectious Disease | 2 | C | 30 |  |
| BUK-EHS 405 | Managing Risks from Human Exposure to Environmental Contaminants | 2 | C | 30 |  |
| BUK-EHS 406 | Antimicrobial Resistance (AMR) | 2 | C | 30 |  |
| BUK-EHS 407 | Current and Emerging Environmental Health Issues | 2 | C | 30 |  |
| BUK-EHS 409 | Human and Animal Health in a Changing Environment | 2 | C | 30 |  |
|  | **TOTAL** | **19** |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **500 LEVEL** | | | | | |
| **Course Code** | **Course Title** | **Unit (s)** | **Status** | **LH** | **PH** |
| BUK-EHS 501 | Environmental Health Disparities in Children | 2 | C | 30 |  |
| BUK-EHS 502 | Industrial Hygiene in Environmental Health Science | 2 | C | 15 | 45 |
| BUK-EHS 503 | Microbiome and Environmental Health | 2 | C | 30 |  |
| BUK-EHS 504 | Health Risks of Climate Change | 2 | C | 30 |  |
| BUK-EHS 505 | Environmental Health Policy and Practice | 2 | C | 30 |  |
| BUK-EHS 506 | Environmental Justice and Population Health | 2 | C | 30 |  |
|  | **TOTAL** | **12** |  |  |  |
|  | **GRAND TOTAL** | **49** |  |  |  |

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

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

**Senate approved relevance**

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

**Overview**

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

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

**Objectives:**

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

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

**Learning Outcomes**

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

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

**Course contents**

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

**Minimum academic Standards**

As available in the NUC MAS

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-PIO 201** **Gastrointestinal Tract and Renal Physiology** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Training of highly qualified graduates that can apply the knowledge gained in providing environmental health care interventions, and are capable of reducing chronic infectious and non-communicable diseases and acute complications such as autonomic dysreflexia triggered by constipation, bowel impaction or appendicitis; peptic ulcer aggravating back pain and exercise-induced gastrointestinal distress and also the impact of the renal function. This in-line with the mission of Bayero University Kano of addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

Understanding gastrointestinal problems is of utmost importance. The essence is for students to understand the physiology behind environmental-induced gastrointestinal and renal disorders. To understand gastrointestinal disorders triggering abrupt uncontrolled life-threatening increase in blood pressure (autonomic dysreflexia) in patients.

Students are to understand impact of psychological eating disorders such anorexia and bulimia nervosa on in the community. They will also be exposed the basis of how the environmental elements affect the kidney health. The objectives of the course, learning outcomes, and contents are provided to address this need.

**Objectives**

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

1. Describe the structure and functions of the Gastrointestinal Tract
2. State blood supply, neural and humoral control of the Gastrointestinal Tract functions
3. Describe blood redistribution to Gastrointestinal Tract during exercise and Exercise-induced gastrointestinal distress
4. Explain the Physiology of Gastrointestinal disorders such as Appendicitis, Diarrhea, constipation and peptic ulcer and their complications
5. Describe the control of sensations of satiation, hunger and thirst and appetite
6. Describe psychological eating disorders such as anorexia and bulimia nervosa
7. Discuss the functions of the kidneys
8. Explain the functional unit of the kidney, regional differences, cortical and juxtamedullary nephrons
9. Discuss the physiology of urine formation and mechanism of urine concentration counter current mechanism

**Learning Outcomes**

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

1. Explain the structure and functions of the Gastrointestinal Tract
2. State blood supply, neural and humoral control of the Gastrointestinal Tract functions
3. Describe blood redistribution to Gastrointestinal Tract during exercise and Exercise-induced gastrointestinal distress
4. Explain the Physiology of Gastrointestinal disorders such as Appendicitis, Diarrhea, constipation and peptic ulcer and their complications
5. Describe the control of sensations of satiation, hunger and thirst and appetite
6. Describe psychological eating disorders such as anorexia and bulimia nervosa
7. Explain the relevant structures of the kidney such as renal cortex, renal medulla, medullary pyramids, renal artery, renal vein and ureter; the nephron; the physiology of urine formation; Regional Differences in Nephron structure: cortical and juxtamedullary Nephrons.
8. Describe functions of the kidney in Excretion of Metabolic wastes, Regulation of water, electrolyte balances; regulation of body fluid osmolality and electrolyte concentrations. Regulation of acid base balance, Regulation of arterial blood pressure.
9. State the renal handling of K+, Na+, Fe, vitamins, carbohydrates, proteins and lipids; and Renal Failure and chronic kidney disease
10. State the functions of the kidneys
11. Highlight the functional unit of the kidney, regional differences, cortical and juxtamedullary nephrons
12. Explain the physiology of urine formation and mechanism of urine concentration counter current mechanism

**Course contents**

Introduction to the Gastrointestinal Tract and its Functions. Methods of studying the functions and structure of the Gastrointestinal Tract Layers. Neural and Humoral control, Autonomic innervation of the Gastrointestinal Tract. Sympathetic and parasympathetic Gastro-intestinal reflexes and blood supply to the GIT. Blood redistribution during exercise. Exercise-induced gastrointestinal distress. Functional types of movements in the Gastrointestinal Tract, Propulsive and mixing. Hormonal control of Gastrointestinal Tract Motility. The oral Cavity, Mastication. Salivary glands. Functions of Saliva, Salivary reflexes. Inhibition of salivary secretion. Physio-anatomical consideration of Mixing and propulsion of food in the stomach. Regulation of gastric motility. Gastric Secretion: Composition, properties and functions of gastric juice. Effects of Nutrient types on gastric secretion. Regulation of gastric secretion Stomach (gastric) emptying. Vomiting and major causes. Diarrhea and major causes. Composition, properties and functions of pancreatic juice. Defecation: Control of colonic and rectal motility-myogenic and neural control Physiology of absorption: Mechanism of absorption. Absorption in the mouth. Stomach small and large intestines (Note: absorption of CHO, proteins, fats, water, Na+,K+,P+Cl,HCO3 etc). Control of Sensations of satiation, hunger and thirst; appetite. Physiology of Gastrointestinal disorders: Appendicitis, constipation cancerous tumors peptic ulcer Jaundice.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 202 Water, Wastewater, and Health (2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate and relevant knowledge and skills to examines the relationship between water, wastewater and public health. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course that examines the relationship between water, wastewater and public health. The course will provide an overview of the sources, quality and management of water and wastewater and the impact they have on human health.

This course is designed for students who are interested in the field of environmental health, public health, civil engineering, and related fields. It will provide students with a comprehensive understanding of the relationship between water, wastewater and public health, and will equip them with the knowledge and skills to address these issues and promote health equity in communities.

**Objectives**

1. Discuss the sources, quality, and management of water and wastewater and their impact on human health.
2. Analyze the health impacts of exposure to contaminated water and wastewater, including waterborne diseases and chemical exposure.
3. Evaluate the impact of climate change on water and wastewater management and public health.
4. Identify the laws, regulations and policies governing water and wastewater management and public health and how to apply them in real-world scenarios
5. Develop critical thinking skills to analyze and interpret data, research and policy related to water, wastewater and public health and communicate effectively about these issues.

**Learning outcomes**

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

1. explain the sources and quality of drinking water and wastewater and their impact on human health.
2. analyze the health impacts of exposure to contaminated water and wastewater, including waterborne diseases and chemical exposure.
3. evaluate the impact of climate change on water and wastewater management and public health and apply it to real-world scenarios.
4. understand the laws, regulations, and policies governing water and wastewater management and public health and develop strategies to address these issues and promote health equity in communities.
5. develop critical thinking skills to analyze and interpret data, research, and policy related to water, wastewater, and public health and communicate effectively about these issues.

**Course content**

The sources and quality of drinking water, including surface water and groundwater sources, treatment, and distribution. The sources and quality of wastewater, including domestic and industrial wastewater, treatment, and discharge. The health impacts of exposure to contaminated water and wastewater, including waterborne diseases, and chemical exposure. The impact of climate change on water and wastewater management and public health. The laws, regulations and policies governing water and wastewater management and public health. The role of water, wastewater and sanitation in achieving the Sustainable Development Goals. Water, wastewater and sanitation in emergency situations. The role of water, wastewater and sanitation in COVID-19 pandemic. The role of water, wastewater and sanitation in environmental justice and health equity. Water, wastewater and sanitation in developing countries. The latest technological advancements and innovations in water and wastewater management and treatment. Hands-on training with water and wastewater sampling and analysis techniques. The role of water, wastewater, and sanitation in achieving the Sustainable Development Goals. Water, wastewater and sanitation in emergency situations. The role of water, wastewater, and sanitation in COVID-19 pandemic. The role of water, wastewater and sanitation in environmental justice and health equity. Water, wastewater and sanitation in developing countries.

**Minimum academic standards:**

As available in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 301 Health and Sustainability** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate and relevant knowledge and skills in taking actions to protect and preserve the natural systems that support human health and well-being including reducing exposure to environmental toxins and pollutants. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

Health and sustainability are closely linked in the field of environmental health. Sustainability refers to the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. In the context of environmental health, it means taking actions to protect and preserve the natural systems that support human health and well-being. One of the key aspects of health and sustainability is reducing exposure to environmental toxins and pollutants. This includes efforts to reduce emissions from industrial and transportation sources, as well as reducing the use of toxic chemicals in consumer products. It also includes protecting vulnerable populations, such as children and pregnant women, from exposure to harmful substances.

Another important aspect of health and sustainability is promoting healthy and sustainable lifestyles. This includes encouraging active transportation, such as walking and biking, as well as promoting access to green spaces and parks. It also includes promoting healthy and sustainable food systems, such as local and organic agriculture, to improve access to healthy and nutritious food. Climate change is also a key area of concern in the intersection of health and sustainability. The impacts of climate change, such as extreme weather events, rising sea levels, and changes in the distribution of disease vectors, can have significant impacts on public health. To address these impacts, it is important to reduce greenhouse gas emissions, and to invest in public health infrastructure and education programs to help communities prepare for and adapt to the effects of climate change. Overall, health and sustainability are closely linked in the field of environmental health. To promote health and well-being, it is important to take actions to protect and preserve the natural systems that support human health, reduce exposure to environmental toxins and pollutants, and promote healthy and sustainable lifestyles.

**Objectives**

1. Identify the link between health and sustainability in the context of environmental health

2. Analyze the impact of environmental toxins and pollutants on human health

3. Evaluate the effectiveness of interventions and policies aimed at promoting health and sustainability

4. Develop critical thinking skills to analyze and interpret scientific literature on health and sustainability in environmental health

5. Identify the role of environmental justice in addressing health and sustainability issues in environmental health.

**Learning outcomes**

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

1. explain the link between health and sustainability in the context of environmental health

2. analyze the impact of environmental toxins and pollutants on human health and the effectiveness of interventions to reduce exposure

3. evaluate the effectiveness of policies and interventions aimed at promoting health and sustainability

4. analyze and interpret scientific literature on health and sustainability in environmental health, and communicate their findings effectively

5. explain the role of environmental justice in addressing health and sustainability issues in environmental health, and develop strategies to promote health equity.

**Course content**

The impact of land use change on public health, Biodiversity and human health, The influence of nature exposure on human health, The intersection of urbanization, public health, and sustainability. Sustainable agriculture and food systems. Renewable energy and public health. Sustainable transportation and health. Green spaces and mental health Sustainable urban design and public health. Climate-resilient healthcare systems Environmental impact of natural resource extraction. Corporate sustainability and environmental health. Eco-friendly consumer choices and health. Climate change adaptation strategies and health. Environmental health education and outreach. Public health ethics and environmental sustainability. Environmental sustainability and global health governance.

**Minimum academic standards**

As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 302 Environmental Health in Media** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Equipping graduates with contextual and relevant knowledge and skills in Filmmaking and documentaries which can be a powerful tool for raising awareness about environmental health issues and influencing public opinion, it is also important for the graduates to respect cultural norms and values that shape how environmental health issues are portrayed and perceived. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**:

Filmmakers and documentaries can be powerful tools for raising awareness about environmental health issues and influencing public opinion. They can use emotional storytelling and powerful imagery to bring attention to issues that may not be widely covered in traditional media outlets. This can help to educate the public about the risks and effects of environmental health issues and inspire them to take action. However, it is important to note that not all documentaries and films are created equal, and some may be more accurate and unbiased than others. It is important for audiences to critically evaluate the information presented in these films, and to seek out additional information and perspectives from reputable sources.

Additionally, it's important to consider the cultural norms and values that shape how environmental health issues are portrayed and perceived. Different cultures and societies may have different priorities and perspectives on these issues, which can influence the way they are represented in films and documentaries. This can lead to debates and disagreements about the best ways to address environmental health issues, and the role that media can play in shaping public opinion and policy. Overall, documentaries and films can be powerful tools for raising awareness and influencing public opinion about environmental health issues, but it's important to view them critically and consider the cultural norms and values that shape how these issues are represented and perceived.

**Objectives**

1. Identify the role of media and communications in promoting sustainability and raising awareness about environmental issues.

2. Develop skills in creating effective and engaging communications materials, such as press releases, brochures, and social media content, to promote sustainability.

3. Analyze and evaluate the impact of media and communications strategies on public opinion and policy-making related to sustainability.

4. Discuss the cultural and societal factors that shape perceptions of environmental issues and how they are represented in the media.

5. Develop critical thinking skills to evaluate the accuracy and bias of media coverage of sustainability and environmental issues.

**Learning outcomes**

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

1. identify the key environmental issues and challenges related to sustainability and how they are represented in media and communications.

2. create effective and engaging communications materials that promote sustainability, such as press releases, brochures, and social media content.

3. evaluate the impact of different media and communication strategies on public opinion and policy-making related to sustainability.

4. analyze the cultural and societal factors that shape perceptions of environmental issues and how they are represented in media.

5. demonstrate critical thinking skills in evaluating the accuracy and bias of media coverage of sustainability and environmental issues.

**Course content**

Introduction to media communication. Media representation of environmental issues. The role of social media in environmental activism. Environmental communication strategies for different audiences. The impact of advertising on environmental consumption patterns. The role of science communication in environmental decision-making. The intersection of race, class, and environmental health. Ethics and responsibility in environmental journalism. The role of media in promoting sustainability awareness. Sustainable development goals and their communication through media. Environmental storytelling and its impact on sustainability. The influence of media on public opinion and behavior towards sustainability. Green marketing and its role in promoting sustainability. The impact of social media on sustainability awareness and activism. Corporate social responsibility and sustainability communication. Environmental journalism and its impact on sustainability policies. The role of media in promoting sustainable consumption. The use of visual and digital media in promoting sustainability education and outreach.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 303 Occupational Sampling and Analysis** **(2 Units, status C, LH 15, PH 45)**

**Senate approved relevance**

The course will provide graduates with sufficient information and skills in the techniques and methods used to collect and analyze samples from the environment and the workplace including regulations and guidelines for environmental and occupational sampling and analysis, such as OSHA, EPA and NIOSH standards, as well as the ethical considerations related to sampling and analysis. This is in line with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course is designed to provide students with a foundational understanding of the techniques and methods used to collect and analyze samples from the environment and the workplace. This course will cover a range of sampling techniques, including air, water, soil, and biological sampling, as well as the methods used to analyze these samples, such as chemical analysis, microbiological analysis, and instrumentation analysis.

Students will learn about the importance of sample preservation, quality control, and quality assurance to ensure the accuracy and integrity of the data obtained. Additionally, the course will cover the regulations and guidelines for environmental and occupational sampling and analysis, such as OSHA, EPA and NIOSH standards, as well as the ethical considerations related to sampling and analysis.

**Objectives**

1. Explain the techniques and methods used to collect and analyze samples from the environment and the workplace
2. Develop skills in using a range of sampling techniques, including air, water, soil, and biological sampling
3. Discuss the importance of sample preservation, quality control, and quality assurance to ensure the accuracy and integrity of data obtained
4. Discuss the regulations and guidelines for environmental and occupational sampling and analysis, such as OSHA, EPA, and NIOSH standards
5. Discuss the ethical considerations related to sampling and analysis and the importance of safety while collecting and analyzing samples.

**Learning outcomes**

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

1. explain the techniques and methods used to collect and analyze samples from the environment and the workplace
2. use a range of sampling techniques, including air, water, soil, and biological sampling
3. demonstrate understanding of the importance of sample preservation, quality control, and quality assurance to ensure the accuracy and integrity of data obtained
4. explain the regulations and guidelines for environmental and occupational sampling and analysis, such as OSHA, EPA, and NIOSH standards
5. demonstrate understanding of the ethical considerations related to sampling and analysis and the importance of safety while collecting and analyzing samples.

**Course content**

The principles and practices of environmental and occupational sampling. Air sampling techniques and analysis of air pollutants. Water sampling techniques and analysis of water quality parameters. Soil sampling techniques and analysis of soil contaminants. Biological sampling techniques and analysis of biological samples. Techniques for the preservation and storage of environmental and occupational samples. Quality control and quality assurance in environmental and occupational sampling and analysis. Regulations and guidelines for environmental and occupational sampling and analysis, such as OSHA, EPA, and NIOSH standards. The use of instrumentation in environmental and occupational sampling and analysis. Microbiological analysis of environmental and occupational samples. Chemical analysis of environmental and occupational samples. Sample collection and analysis for specific industries such as agriculture and mining. The use of remote sensing and GIS in environmental and occupational sampling and analysis. The use of bioindicator organisms in environmental and occupational sampling and analysis. The ethical considerations related to environmental and occupational sampling and analysis. The use of statistical methods in environmental and occupational sampling and analysis. The importance of safety while collecting and analyzing environmental and occupational samples.

**Minimum academic standards:**

As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 305: Ecology of Environmentally Transmitted Microbiological Hazards (2 Units, status C, LH 15, PH 45)**

**Senate approved relevance**

Training graduates with appropriate and relevant knowledge and skills to examines the interactions between microorganisms and the environment that can lead to the transmission of infectious diseases to humans and animals. They should also be able to examine the impact of human activities on the ecology of microbiological hazards, such as land-use changes, pollution, and climate change. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the interactions between microorganisms and the environment that can lead to the transmission of infectious diseases to humans and animals. This course will cover the various types of microorganisms that can be transmitted through the environment, such as bacteria, viruses, and parasites, as well as the ecological factors that influence their distribution and survival. Students will learn about the different routes of transmission, such as through water, air, food and animals, and the impact of environmental changes on the transmission of microbiological hazards.

The course will also examine the impact of human activities on the ecology of microbiological hazards, such as land-use changes, pollution, and climate change. Additionally, the course will cover the role of public health interventions and policies in preventing the transmission of environmentally transmitted microbiological hazards.

**Objectives**

1. Explain the interactions between microorganisms and the environment that can lead to the transmission of infectious diseases
2. Analyze the ecological factors that influence the distribution and survival of microorganisms
3. Evaluate the impact of environmental changes on the transmission of microbiological hazards
4. Develop critical thinking skills to analyze and interpret scientific literature on the ecology of microbiological hazards
5. Discuss the role of public health interventions and policies in preventing the transmission of environmentally transmitted microbiological hazards.

**Learning outcomes**

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

1. to explain the interactions between microorganisms and the environment that can lead to the transmission of infectious diseases
2. analyze the ecological factors that influence the distribution and survival of microorganisms
3. evaluate the impact of environmental changes on the transmission of microbiological hazards
4. analyze and interpret scientific literature on the ecology of microbiological hazards and communicate their findings effectively
5. understand the role of public health interventions and policies in preventing the transmission of environmentally transmitted microbiological hazards and develop strategies to address the issue.

**Course content**

The types of microorganisms that can be transmitted through the environment, such as bacteria, viruses, and parasites. The ecological factors that influence the distribution and survival of microorganisms, such as temperature, humidity, and sunlight. The different routes of transmission for environmentally transmitted microbiological hazards, such as through water, air, food, and animals. The impact of environmental changes on the transmission of microbiological hazards, such as climate change and land-use changes. The impact of human activities on the ecology of microbiological hazards, such as pollution and deforestation. The role of One Health approach in understanding the ecology of microbiological hazards. The impact of agriculture and livestock industry on the ecology of microbiological hazards. The role of environmental contamination in the transmission of microbiological hazards. The use of remote sensing and EHMIS in understanding the ecology of microbiological hazards. The use of bioindicator organisms in understanding the ecology of microbiological hazards. The impact of natural disasters on the ecology of microbiological hazards. The impact of urbanization on the ecology of microbiological hazards. The impact of industrialization on the ecology of microbiological hazards. The ethical considerations related to the ecology of microbiological hazards. The role of surveillance systems in monitoring the ecology of microbiological hazards. The impact of COVID-19 pandemic on the ecology of microbiological hazards. The importance of public awareness and education in understanding the ecology of microbiological hazards.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 306 Geographic Information Systems (GIS) in Environmental Health Science (2 Units, status C, LH 30)**

**Senate approved relevance**

The course will help students understand their role in providing a variety of practical skills to explores the use of GIS technology to analyze and visualize the relationships between environmental factors and human health, students need to understand also the ethical considerations related to GIS and health data, as well as the use of GIS in public health practice, such as disease surveillance, environmental health monitoring, and community engagement This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course explores the use of GIS technology to analyze and visualize the relationships between environmental factors and human health. This course will cover the fundamental concepts of GIS and the various applications of GIS in environmental health science, such as spatial data analysis, mapping, and modelling. Students will learn about the various types of spatial data and how to acquire, manage, and analyze them using GIS software.

Additionally, the course will cover the ethical considerations related to GIS and health data, as well as the use of GIS in public health practice, such as disease surveillance, environmental health monitoring, and community engagement. The course will also provide hands-on experience in working with GIS software, such as ArcGIS, QGIS, and R-ArcGIS.

**Objectives**

1. Discuss the fundamental concepts of Geographic Information Systems (GIS) and its applications in environmental health science such as Environmental Health Management Information Systems (EHMIS).

2. Identify how to acquire, manage and analyze spatial data using GIS software.

3. Develop the ability to use GIS tools for spatial data analysis, mapping and modelling

4. Discuss the ethical considerations related to GIS and health data

5. Discuss the use of GIS in public health practice, such as disease surveillance, environmental health monitoring, and community engagement.

**Learning outcomes**

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

1. explain the fundamental concepts of Geographic Information Systems (GIS) and its applications in environmental health science.

2. acquire, manage, and analyze spatial data using GIS software.

3. use GIS tools for spatial data analysis, mapping, and modelling.

4. describe the ethical considerations related to GIS and health data

5. explain the use of GIS in public health practice and apply it to real-world scenarios.

**Course content**

Introduction to Geographic Information Systems (GIS) and its applications in environmental health science. Fundamentals of spatial data and data acquisition. Data management and quality control in GIS. Spatial data analysis and modelling in GIS. Mapping and visualization of spatial data in GIS. GIS software, such as ArcGIS, QGIS, and R-ArcGIS. GIS in disease surveillance and outbreak investigation. GIS in environmental health monitoring. GIS in community engagement and health promotion. GIS and spatial statistics. GIS and remote sensing. Life-table techniques. GIS and health impact assessment. GIS and risk assessment. GIS and health security. GIS and One Health approach. GIS and COVID-19 pandemic. Ethical considerations related to GIS and health data.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 401 Global Environmental Change and Public Health** **(2 Units, status C, LH 30)**

**Senate approved relevance**

The course will help students understand their role in providing a variety of knowledge and practical skills to changes that have significant impacts on public health, both directly and indirectly including increased frequency and severity of extreme weather events (such as heat waves, floods, and droughts) leading to death, injury, and disease. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

Global Environmental Change (GEC) refers to the alterations of natural systems caused by human activities, including climate change, land-use change, biodiversity loss, and pollution. These changes have significant impacts on public health, both directly and indirectly. Direct impacts of GEC on public health include increased frequency and severity of extreme weather events (such as heat waves, floods, and droughts) leading to death, injury, and disease. Indirect impacts of GEC on public health include changes in the distribution of disease vectors (such as mosquitoes, ticks) and the emergence of new diseases due to changes in the environment.

Climate change, specifically, is one of the most pressing public health issues of our time. It can cause an increase in temperature-related illnesses and deaths, as well as more extreme weather events. It also exacerbates air pollution, and can lead to changes in the distribution of disease-carrying organisms, such as mosquitoes and ticks. Air pollution is another major environmental health concern. It can lead to respiratory and cardiovascular diseases, cancer, and even premature death. Exposure to toxic chemicals and pollutants, such as lead and mercury, can also have severe health effects, particularly for vulnerable populations such as pregnant women and children. Land-use change, such as deforestation and urbanization, can also have significant impacts on public health. Deforestation can lead to loss of biodiversity, which can result in changes in the distribution of disease vectors and emergence of new diseases. Urbanization can lead to increased air pollution, heat island effects, and reduced access to green spaces, which can all negatively impact public health. To tackle these issues, it is important to adopt a holistic approach that integrates the consideration of environmental, social, and economic factors. This may include implementing policies and regulations that reduce emissions and pollution, promoting sustainable land-use and biodiversity conservation, and investing in public health infrastructure and education programs. Overall, global environmental change poses a significant threat to public health, and it is important that we take action to address it.

**Objectives**

1. Discuss the causes and impacts of global environmental change on public health

2. Analyze the relationship between climate change and human health

3. Evaluate the effectiveness of policies and interventions aimed at addressing the impacts of global environmental change on public health

4. Develop critical thinking skills to analyze and interpret scientific literature on global environmental change and public health

5. identify the role of environmental justice in addressing global environmental change and its impact on public health disparities.

**Learning outcomes**

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

1. explain the causes and impacts of global environmental change on public health

2. analyze the relationship between climate change and human health, and evaluate the potential health impacts of different climate change scenarios

3. critically evaluate the effectiveness of policies and interventions aimed at addressing the impacts of global environmental change on public health

4. analyze and interpret scientific literature on global environmental change and public health, and communicate their findings effectively

5. explain the role of environmental justice in addressing global environmental change and its impact on public health disparities, and develop strategies to promote health equity.

**Course content**

Climate change and its impacts on human health. Air pollution and respiratory illness. Water contamination and public health. Effects of chemical exposure on communities. Natural disasters and public health preparedness. Environmental justice and marginalized communities. Sustainable transportation and public health. Impact of plastic pollution on marine life and human health. Energy production and public health. Green building and its effect on indoor air quality and human health. Climate change adaptation and public health, Climate change and infectious diseases. The health effects of extreme weather events. The health impacts of natural resource extraction. Environmental health and economic development. Environmental health and international relations. Environmental health in conflict and post-conflict settings

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-GST 401 Character Building, Professionalism and Team Work in Healthcare. (2 Units, status C, LH 30)**

**Senate approved relevance**

This course is designed in line with the vision and mission of the Bayero University, Kano to produce graduates that are highly qualified with excellent knowledge and high proficiency in skills capable of delivering excellent, respectful, empathic and culturally attuned healthcare services to society devoid of exploitation. The character, professional outlook as well as the work ethics of the graduates would be sharpened by the course to achieve this goal.This course would further strengthen the graduates to work as a team in the health sector to achieve the desired objectives. It should encourage individual members’ professional development through appropriate mentorship and character building. The course will discourage the development of the barrage of emerging 21st century societal vices inclusive of, but not limited to drug and substance abuse. In essence the course would entrench the humane and professional aspects of the graduates as they serve the society equipped with knowledge and skills consistent with the vision and mission of the Bayero University, Kano.

**Overview**

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

Accordingly, this course would prepare graduates from this programme to deploy their expertise in knowledge, skills, professionalism and work ethics in a culturally accepted manner, in the various services they offer to a variety of clients in healthcare, academia and other fields of endeavor. 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 this course are 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, the 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 content**

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**:

As contained in the NUC MAS in addition to a projector and flip chart.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 402 Risk and Vulnerability in Environmental Health.** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate and relevant knowledge and skills to examines the factors that contribute to an individual or community's risk of exposure to environmental hazards and the impacts these hazards can have on health and the impact of climate change on risk and vulnerability, and how it exacerbates existing environmental health disparities. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

Examines the factors that contribute to an individual or community's risk of exposure to environmental hazards and the impacts these hazards can have on health. This course will explore the concept of vulnerability, which refers to an individual or community's susceptibility to harm from environmental hazards, and the factors that contribute to vulnerability such as poverty, race, and lack of access to resources.

Students will learn about the various environmental hazards that pose risks to human health, such as air pollution, water contamination, and exposure to toxic chemicals, and how these hazards disproportionately affect vulnerable populations. The course will also examine the impact of climate change on risk and vulnerability, and how it exacerbates existing environmental health disparities.

**Objectives**

1. Discuss the concept of risk and vulnerability in relation to environmental health hazards

2. Analyze the factors that contribute to an individual or community's risk of exposure to environmental hazards and its impact on health

3. Evaluate the effectiveness of interventions and policies aimed at reducing risk and vulnerability to environmental hazards

4. Develop critical thinking skills to analyze and interpret scientific literature on risk and vulnerability in environmental health

5. Discuss the role of environmental justice in addressing risk and vulnerability to environmental health hazards

**Learning outcomes**

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

1. explain the concept of risk and vulnerability in relation to environmental health hazards

2. analyze the factors that contribute to an individual or community's risk of exposure to environmental hazards and its impact on health

3. evaluate the effectiveness of interventions and policies aimed at reducing risk and vulnerability to environmental hazards

4. analyze and interpret scientific literature on risk and vulnerability in environmental health, and communicate their findings effectively

5. explain the role of environmental justice in addressing risk and vulnerability to environmental health hazards and develop strategies to promote health equity.

**Course content**

Environmental hazards and health risks. Vulnerability assessment and mapping. The impact of migration on risk and vulnerability. The impact of war and conflict on risk and vulnerability. The impact of natural disasters on risk and vulnerability. Exposure pathways and toxicology. Risk communication and public health education. Natural disasters and environmental health. The impact of the built environment on risk and vulnerability. The impact of globalization on risk and vulnerability. The impact of land use change on risk and vulnerability. The impact of natural resource extraction on risk and vulnerability. Environmental health in low- and middle-income countries.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 403 Pharmacogenetics and Toxicogenomics in Environmental Health (2 Units, status C, LH 30)**

**Senate approved relevance**

The course will train graduates in the understanding of toxins and how individuals’ susceptibility will affect their health and that of the environment. This is consistent with the mission and vision of the university in providing knowledge and expertise in health and environmental concerns.

**Overview**

The course examines the role of genetics and genomics in understanding individual susceptibility to the effects of environmental toxins. The course will provide an overview of pharmacogenetics, the study of how genetic variations affect drug response, and toxicogenomics, the study of how genetic variations affect response to environmental toxins.

It will provide students with a comprehensive understanding of the role of genetics and genomics in understanding individual susceptibility to the effects of environmental toxins, and will equip them with the knowledge and skills to use genetic information to improve human health and protect populations from environmental hazards.

**Objectives**

1. Define the following terms: pharmacology, therapeutics, pharmacodynamics, toxicology, chemical toxicology and poisons

2. Discuss the basics of genetics and genomics, including DNA structure and function, genetic variation, and gene regulation and its relation to environmental toxins

3. Analyze the role of genetics in individual susceptibility to environmental toxins, including the role of genetic variations in drug metabolism and toxicant detoxification

4. Evaluate the use of pharmacogenetics and toxicogenomic in risk assessment, drug development, and the identification of new environmental toxins

5. Discuss the ethical, legal, and social implications of pharmacogenetics and toxicogenomic, and the use of bioinformatics tools and technology for the analysis of genetic data

6. Develop critical thinking skills to analyze and interpret data, research, and policy related to the concepts of pharmacogenetics and toxicogenomic in environmental health sciences and communicate effectively about these issues.

**Learning outcomes**

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

1. define the terms pharmacology, therapeutics, pharmacodynamics, toxicology, chemical toxicology and poisons
2. explain the basics of genetics and genomics, including DNA structure and function, genetic variation, and gene regulation and its relation to environmental toxins
3. analyze the role of genetics in individual susceptibility to environmental toxins, including the role of genetic variations in drug metabolism and toxicant detoxification, and apply it to real-world scenarios.
4. evaluate the use of pharmacogenetics and toxicogenomic in risk assessment, drug development, and the identification of new environmental toxins
5. describe the ethical, legal, and social implications of pharmacogenetics and toxicogenomic, and the use of bioinformatics tools and technology for the analysis of genetic data.
6. develop critical thinking skills to analyze and interpret data, research, and policy related to the concepts of pharmacogenetics and toxicogenomics in environmental health sciences, and communicate effectively about these issues.

**Course content**

Definition and concept of pharmacology and therapeutics; classifications of pharmacology and their applications; terminologies and abbreviation; types and nature of drugs; pharmacodynamics; Pharmacokinetics; classification of drugs and their importance; controlled drugs, drug use, abuse and addiction; introduction to chemical toxicology; introduction to pharmaceutical waste; General principles of management of poisons. Drug regulation and regulatory frame work. The basics of genetics and genomics, including DNA structure and function, genetic variation, and gene regulation. The role of genetics in individual susceptibility to environmental toxins, including the role of genetic variations in drug metabolism and toxicant detoxification. The use of pharmacogenetics and toxicogenomics in risk assessment, including the use of genetic markers to predict individual susceptibility to environmental toxins. The use of pharmacogenetics and toxicogenomics in drug development, including the use of genetic information to optimize drug dosing and reduce adverse reactions. The use of pharmacogenetics and toxicogenomics in the identification of new environmental toxins and the development of new treatments for toxicant-induced diseases. The impact of environmental exposures on the epigenetics and epigenomic changes. The ethical, legal, and social implications of pharmacogenetics and toxicogenomics, including issues related to genetic privacy and discrimination. The use of bioinformatics tools and technology for the analysis of genetic data in pharmacogenetics and toxicogenomics. The basics of genetics and genomics, including DNA structure and function, genetic variation, and gene regulation. The role of genetics in individual susceptibility to environmental toxins, including the role of genetic variations in drug metabolism and toxicant detoxification. The use of pharmacogenetics and toxicogenomics in risk assessment, including the use of genetic markers to predict individual susceptibility to environmental toxins. The use of pharmacogenetics and toxicogenomics in drug development, including the use of genetic information to optimize drug dosing and reduce adverse reactions. The use of pharmacogenetics and toxicogenomics in the identification of new environmental toxins and the development of new treatments for toxicant-induced diseases. The impact of environmental exposures on the epigenetics and epigenomic changes. The ethical, legal, and social implications of pharmacogenetics and toxicogenomics, including issues related to genetic privacy and discrimination. The use of bioinformatics tools and technology for the analysis of genetic data in pharmacogenetics and toxicogenomics

**Minimum academic standards:** As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 404 Environmental Change and Infectious Diseases** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to examines the relationship between environmental changes and the emergence and spread of infectious diseases including changes in land use, climate change, and globalization, and the impact these changes have on the transmission of infectious diseases. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course that examines the relationship between environmental changes and the emergence and spread of infectious diseases. The course will provide an overview of the environmental factors that drive the emergence of infectious diseases, including changes in land use, climate change, and globalization, and the impact these changes have on the transmission of infectious diseases.

The course will also provide students with a comprehensive understanding of the relationship between environmental changes and the emergence and spread of infectious diseases, and will equip them with the knowledge and skills to address these issues and promote health equity in communities.

**Objectives**

1. Discuss the environmental factors that drive the emergence of infectious diseases, including changes in land use, climate change, and globalization.

2. Analyze the impact of these changes on the transmission of infectious diseases, including the role of wildlife, domestic animals, and insects.

3. Evaluate the impact of globalization, emerging technologies and energy production, biodiversity loss, urbanization, and population growth on infectious disease emergence.

4. Discuss the role of social determinants of health in shaping infectious disease outcomes and develop strategies to address environmental change and infectious disease and promote health equity in communities.

5. Develop critical thinking skills to analyze and interpret data, research and policy related to environmental change and infectious disease, and communicate effectively about these issues.

**Learning outcomes**

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

1. explain the environmental factors that drive the emergence of infectious diseases and their impact on the transmission of infectious diseases.

2. analyze the impact of changes in land use, climate change, and globalization on the emergence and spread of infectious diseases.

3. evaluate the impact of globalization, emerging technologies and energy production, biodiversity loss, urbanization, and population growth on infectious disease emergence and apply it to real-world scenarios.

4. describe the role of social determinants of health in shaping infectious disease outcomes and develop strategies to address environmental change and infectious disease and promote health equity in communities.

5. develop critical thinking skills to analyze and interpret data, research, and policy related to environmental change and infectious disease, and communicate effectively about these issues.

**Course content**

The ecology of infectious diseases, including the role of wildlife, domestic animals, and insects in disease transmission. Climate change and its impact on the emergence and spread of infectious diseases. Land-use change and its impact on the emergence and spread of infectious diseases. The impact of globalization on the emergence and spread of infectious diseases. The impact of emerging technologies and energy production on infectious disease emergence. The impact of biodiversity loss and ecosystem degradation on infectious disease emergence. The impact of urbanization and population growth on infectious disease emergence. The impact of COVID-19 pandemic on environmental change and infectious disease. The role of social determinants of health in shaping infectious disease outcomes. Strategies for addressing environmental change and infectious disease and promoting health equity. The intersection of environmental change, infectious disease, and One health. The role of surveillance and monitoring in detecting and responding to emerging infectious diseases. The historical context of infectious disease emergence. The role of zoonotic diseases in human health. The impact of deforestation and habitat destruction on infectious disease emergence. The impact of global travel and tourism on infectious disease emergence. The role of antimicrobial resistance (AMR) in infectious disease emergence.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 405 Managing Risks from Human Exposure to Environmental Contaminants (2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to examines the identification, assessment, and management of environmental contaminants that can impact human health. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the identification, assessment, and management of environmental contaminants that can impact human health. The course will provide an overview of the types of environmental contaminants and their sources, as well as the methods used to assess human exposure and the potential health effects associated with exposure.

It will provide students with a comprehensive understanding of the identification, assessment, and management of environmental contaminants that can impact human health, and will equip them with the knowledge and skills to promote health and protect communities from environmental hazards.

**Objectives**

1. Describe the types of environmental contaminants and their sources

2. Analyze the methods used to assess human exposure to environmental contaminants and the potential health effects associated with exposure

3. Evaluate the laws, regulations, and policies governing environmental contamination and human health, and the impact of climate change on human exposure to environmental contaminants

4. Describe the principles and practices of risk management, including risk assessment, risk communication, and risk reduction

5. Develop critical thinking skills to analyze and interpret data, research, and policy related to environmental contamination and human health, and communicate effectively about these issues.

**Learning outcomes**

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

1. explain the types of environmental contaminants and their sources.

2. analyze the methods used to assess human exposure to environmental contaminants and the potential health effects associated with exposure, and apply it to real-world scenarios.

3. evaluate the laws, regulations, and policies governing environmental contamination and human health, and the impact of climate change on human exposure to environmental contaminants.

4. describe the principles and practices of risk management, including risk assessment, risk communication, and risk reduction.

5. develop critical thinking skills to analyze and interpret data, research, and policy related to environmental contamination and human health, and communicate effectively about these issues.

**Course content**

The types of environmental contaminants, including chemicals, radiation, and biological agents. The sources of environmental contaminants, including industrial and agricultural activities, transportation, and natural sources. The methods used to assess human exposure to environmental contaminants, including air and water monitoring, biomonitoring, and epidemiological studies. The potential health effects associated with exposure to environmental contaminants, including cancer, reproductive and developmental effects, and neurological effects. The principles and practices of risk management, including risk assessment, risk communication, and risk reduction. The laws, regulations, and policies governing environmental contamination and human health. The impact of climate change on human exposure to environmental contaminants. The role of community engagement in managing risks from environmental contaminants. The assessment and control of exposure to heavy metals, pesticides and other pollutants in the food chain. The impact of land use and land-use change on human exposure to environmental contaminants. The assessment and control of exposure to environmental contaminants in the indoor environment. The assessment and management of exposure to environmental contaminants in the occupational setting. The impact of environmental contaminants on vulnerable populations, such as children, pregnant women, and the elderly. The assessment and management of exposure to environmental contaminants in emerging contaminants and microplastics. The impact of environmental contaminants on global public health. The role of technology and innovation in managing risks from human exposure to environmental contaminants. The impact of climate change on the distribution, fate, transport and impacts of environmental contaminants.

**Minimum academic standards:** As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 406 Antimicrobial Resistance (AMR) (2 Units, Status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to understand the impact of antibiotic resistance on human health and the environment, including the mechanisms of antibiotic resistance, the sources of antibiotic resistance, and the consequences of antibiotic resistance for human health and the environment This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the impact of antibiotic resistance on human health and the environment. This course will cover the mechanisms of antibiotic resistance, the sources of antibiotic resistance, and the consequences of antibiotic resistance for human health and the environment. Students will learn about the scientific evidence linking antibiotic use and resistance, and the factors that contribute to the spread of antibiotic-resistant bacteria.

The course will also examine the impact of antibiotic resistance on food safety and the environment, as well as the role of public health interventions and policies in addressing the problem of antibiotic resistance. Additionally, students will learn about the recent developments in the field of AMR, including the impact of COVID-19 pandemic on AMR.

**Objectives**

1. Discuss the mechanisms of antibiotic resistance and the sources of antibiotic resistance

2. Analyze the consequences of antibiotic resistance for human health and the environment

3. Evaluate the effectiveness of interventions and policies aimed at reducing the spread of antibiotic-resistant bacteria

4. Develop critical thinking skills to analyze and interpret scientific literature on antibiotic resistance and its impact on public health and the environment

5. Discuss recent developments in the field of Antimicrobial Resistance, including the impact of COVID-19 pandemic on AMR.

**Learning outcomes**

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

1. explain the mechanisms of antibiotic resistance and the sources of antibiotic resistance

2. analyze the consequences of antibiotic resistance for human health and the environment

3. evaluate the effectiveness of interventions and policies aimed at reducing the spread of antibiotic-resistant bacteria

4. analyze and interpret scientific literature on antibiotic resistance and its impact on public health and the environment and communicate their findings effectively

5. describe the recent developments in the field of Antimicrobial Resistance, including the impact of COVID-19 pandemic on AMR and develop strategies to address the issue.

**Course content**

The mechanisms of antibiotic resistance. The sources of antibiotic resistance, such as overuse and misuse of antibiotics. The consequences of antibiotic resistance for human health, including the spread of antibiotic-resistant infections. The consequences of antibiotic resistance for food safety and the environment. The impact of antibiotic resistance on vulnerable populations. The impact of antibiotic resistance on global health security. The role of public health interventions and policies in addressing the problem of antibiotic resistance. The economic and social determinants of antibiotic resistance. The role of One Health approach in addressing antibiotic resistance. The role of surveillance systems in monitoring the spread of antibiotic-resistant bacteria. The impact of agriculture and livestock industry on antibiotic resistance. The role of environmental contamination in the spread of antibiotic resistance. The use of alternative treatments to antibiotics. The ethics of antibiotic use and resistance. The impact of COVID-19 pandemic on antibiotic resistance. The role of biotechnology in addressing antibiotic resistance. The importance of public awareness and education in addressing antibiotic resistance

**Minimum academic standards:**  As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 407 Current and Emerging Environmental Health Issues (2 Units, status C, LH 30)**

**Senate approved relevance**

Equipping graduates with contextual and relevant knowledge and skills to examines the most pressing environmental health concerns facing society today. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the most pressing environmental health concerns facing society today. The course will provide an overview of the latest research and thinking on a range of environmental health issues. The course will be taught by experts in the field, incorporating the latest research and data to provide students with a comprehensive understanding of the current and emerging environmental health issues.

This course will also provide students with the skills and knowledge to develop strategies to address these issues and promote health equity in communities.

**Objectives**

1. Discuss the most pressing environmental health concerns facing society today and their impact on human health.

2. Analyze the latest research and thinking on a range of environmental health issues, such as air pollution, water pollution, and exposure to hazardous chemicals.

3. Evaluate the impact of natural disasters and extreme weather events, urbanization, agriculture and food production, globalization, and emerging technologies on health.

4. Discuss the role of social determinants of health in shaping environmental health outcomes and how to address environmental health issues and promote health equity in communities.

5. Develop critical thinking skills to analyze and interpret data, research and policy related to environmental health, and communicate effectively about environmental health issues.

**Learning outcomes**

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

1. explain the most pressing environmental health concerns facing society today and their impact on human health.

2. analyze the latest research and thinking on a range of environmental health issues, such as air pollution, water pollution, and exposure to hazardous chemicals.

3. evaluate the impact of natural disasters and extreme weather events, urbanization, agriculture and food production, globalization, and emerging technologies on health and apply it to real-world scenarios.

4. describe the role of social determinants of health in shaping environmental health outcomes, and develop strategies to address environmental health issues and promote health equity in communities.

5. develop critical thinking skills to analyze and interpret data, research and policy related to environmental health, and communicate effectively about environmental health issues.

**Course content**

Climate change and its impact on health. Air pollution and its impact on respiratory health. Water pollution and its impact on waterborne disease. Exposure to hazardous chemicals and their impact on health. The health effects of natural disasters. Extreme weather events. The impact of urbanization and land-use change on health. The impact of agriculture and food production on health. The health effects of emerging technologies and energy production. The health effects of biodiversity loss and ecosystem degradation. The impact of globalization and international trade on health. The role of social determinants of health in shaping environmental health outcomes. The impact of COVID-19 pandemic on environmental health. The impact of Environmental Racism on marginalized communities

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS408 Human and Animal Health in a Changing Environment** **(2 Units, status C, LH 30)**

**Senate approved relevance**

Equipping graduates with contextual and relevant knowledge and skills to examines the impact of environmental changes on the health of humans and animals including range of environmental factors that affect health, such as climate change, pollution, and land-use changes. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the impact of environmental changes on the health of humans and animals. This course will cover a range of environmental factors that affect health, such as climate change, pollution, and land-use changes. Students will learn about the scientific evidence linking these environmental factors to health outcomes, such as respiratory and cardiovascular diseases, infectious diseases, and mental health.

The course will also examine the impact of environmental changes on animal health and the potential spillover effects on human health. Additionally, students will learn about the role of public health interventions and policies in addressing the health impacts of environmental changes, such as disease surveillance, environmental health monitoring, and community engagement.

**Objectives**

1. Discuss the impact of environmental changes on the health of humans and animals

2. Analyze the scientific evidence linking environmental factors to health outcomes

3. Evaluate the effectiveness of interventions and policies aimed at reducing the health risks associated with environmental changes

4. Develop critical thinking skills to analyze and interpret scientific literature on the relationship between environment and health

5. Explain the role of community engagement and health professionals in addressing the health risks of environmental changes

**Learning outcomes**

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

1. explain the impact of environmental changes on the health of humans and animals

2. analyze the scientific evidence linking environmental factors to health outcomes

3. evaluate the effectiveness of interventions and policies aimed at reducing the health risks associated with environmental changes

4. analyze and interpret scientific literature on the relationship between environment and health, and communicate their findings effectively

5. describe the role of community engagement and health professionals in addressing the health risks of environmental changes and develop strategies to promote health equity.

**Course content**

The impact of climate change on human and animal health, The impact of air pollution on human and animal health. The impact of water pollution on human and animal health. The impact of land-use changes on human and animal health. The impact of deforestation on human and animal health. The impact of urbanization on human and animal health. The impact of industrialization on human and animal health. The impact of pesticides and other toxic chemicals on human and animal health. The impact of biodiversity loss on human and animal health. The role of zoonotic diseases in human and animal health. The impact of environmental changes on the spread of non-communicable diseases. The impact of environmental changes on emergency preparedness and response. The role of community engagement in addressing the health risks of environmental changes. The role of health professionals in addressing the health risks of environmental changes

**Minimum academic standards:** As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 501 Environmental Health Disparities in Children (2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to examines the intersection of children's health and the environment, with a particular focus on how environmental exposures disproportionately affect certain populations. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the intersection of children's health and the environment, with a particular focus on how environmental exposures disproportionately affect certain populations. The course will provide an overview of the current literature on children's environmental health disparities and will focus on case studies that illustrate how these disparities manifest in real-world settings.

It will provide students with a comprehensive understanding of the relationship between children's health and the environment, and will equip them with the knowledge and skills to address these issues and promote health equity in communities.

**Objectives**

1. Discuss the impact of environmental toxins on child development and health outcomes and the role of social determinants of health in shaping children's environmental health outcomes.

2. Analyze the impact of environmental exposures on children's cognitive and behavioral development, respiratory health, reproductive health, immune system, nutrition, and mental health.

3. Evaluate the impact of environmental justice on children's environmental health, climate change and its impact on children's environmental health.

4. Describe the role of policy and advocacy in addressing children's environmental health disparities and the importance of hands-on training with environmental sampling and analysis techniques.

5. Develop critical thinking skills to analyze and interpret data, research, and policy related to children's environmental health disparities and communicate effectively about these issues.

**Learning outcomes**

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

1. explain the impact of environmental toxins on child development and health outcomes and the role of social determinants of health in shaping children's environmental health outcomes.

2. analyze the impact of environmental exposures on children's cognitive and behavioral development, respiratory health, reproductive health, immune system, nutrition, and mental health.

3. evaluate the impact of environmental justice on children's environmental health, climate change and its impact on children's environmental health and apply it to real-world scenarios.

4. describe the role of policy and advocacy in addressing children's environmental health disparities and the importance of hands-on training with environmental sampling and analysis techniques.

5. develop critical thinking skills to analyze and interpret data, research, and policy related to children's environmental health disparities and communicate effectively about these issues.

**Course content**

The impact of environmental toxins on child development and health outcomes. The role of social determinants of health in shaping children's environmental health outcomes. The impact of environmental exposures on children's cognitive and behavioral development. The impact of environmental exposures on children's respiratory health. The impact of environmental exposures on children's reproductive health. The impact of environmental exposures on children's immune system and susceptibility to infections. The impact of environmental exposures on children's nutrition. The impact of environmental exposures on children's mental health. The impact of environmental justice on children's environmental health. The impact of climate change on children's environmental health. The role of policy and advocacy in addressing children's environmental health disparities

**Minimum academic standards:** As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 502 Industrial Hygiene in Environmental Health Science (2 Units, status C, LH 15, PH 45)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to examines the principles and practices of industrial hygiene, the science of protecting and promoting the health and safety of workers and the community from chemical, physical and biological hazards in the workplace. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course that examines the principles and practices of industrial hygiene, the science of protecting and promoting the health and safety of workers and the community from chemical, physical and biological hazards in the workplace. The course will provide an overview of industrial hygiene principles and practices, and will focus on the identification, evaluation, and control of workplace hazards.

The course will also provide students with a comprehensive understanding of the principles and practices of industrial hygiene and will equip them with the knowledge and skills to protect and promote the health and safety of workers and the community from workplace hazards.

**Objectives**

1. Discuss the principles of industrial hygiene, including exposure assessment, hazard identification, and risk assessment.

2. Analyze the assessment and control of chemical, physical, and biological hazards in the workplace, including air contaminants, noise, and radiation.

3. Evaluate the impact of industrial hygiene on the environment and the impact of emerging technologies and industries on industrial hygiene and worker safety

4. Discuss the laws, regulations, and policies governing industrial hygiene and worker safety and the latest technological advancements and innovations in industrial hygiene.

5. Develop critical thinking skills to analyze and interpret data, research, and policy related to industrial hygiene and communicate effectively about these issues.

**Learning outcomes**

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

1. explain the principles of industrial hygiene, including exposure assessment, hazard identification, and risk assessment.

2. analyze the assessment and control of chemical, physical, and biological hazards in the workplace, including air contaminants, noise, and radiation and apply it to real-world scenarios.

3. evaluate the impact of industrial hygiene on the environment and the impact of emerging technologies and industries on industrial hygiene and worker safety.

4. explain the laws, regulations, and policies governing industrial hygiene and worker safety, and the latest technological advancements and innovations in industrial hygiene.

5. develop critical thinking skills to analyze and interpret data, research, and policy related to industrial hygiene and communicate effectively about these issues.

**Course content**

The principles of industrial hygiene, including exposure assessment, hazard identification, and risk assessment. The assessment and control of chemical, physical, and biological hazards in the workplace, including air contaminants, noise, and radiation. The assessment and control of ergonomic hazards, including musculoskeletal disorders. The assessment and control of biological hazards in the workplace, including infectious diseases. The assessment and control of fire and explosion hazards. The assessment and control of hazards associated with hazardous materials and waste. The principles and practices of industrial hygiene program management. The impact of occupational health on the environment. The roles of industrial hygienist in different sectors such as healthcare, manufacturing, construction and mining. The laws, regulations and policies governing industrial hygiene and worker safety. The latest technological advancements and innovations in industrial hygiene. Hands-on training with industrial hygiene sampling and analysis techniques. The assessment and control of hazards associated with nanotechnology. The impact of emerging technologies and industries on industrial hygiene and worker safety. The assessment and control of hazards associated with emerging contaminants such as PFAS and microplastics. The assessment and control of hazards associated with indoor air quality. The assessment and control of hazards associated with work-related stress and mental health.

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 503 Microbiome and Environmental Health (2 Units, status C, LH 30)**

**Senate approved relevance**

Training graduates with appropriate knowledge and skills to examines the exposure to environmental toxins and pollutants that can alter the composition and function of the microbiome, leading to negative impacts on health. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The microbiome refers to the collection of microorganisms that live on and in the human body, playing a crucial role in maintaining overall health and well-being. The human microbiome is a complex ecosystem that includes bacteria, viruses, fungi, and protozoa, and it has been found to be closely linked to environmental health. Exposure to environmental toxins and pollutants can alter the composition and function of the microbiome, leading to negative impacts on health. Similarly, changes in land use and biodiversity, such as deforestation and urbanization, can also affect the composition and function of the microbiome, leading to changes in the distribution of disease vectors and emergence of new diseases.

On the other hand, exposure to certain environmental factors, such as nature, green spaces, and a diverse diet, has been shown to positively influence the human microbiome. Overall, the microbiome is closely linked to environmental health, and exposure to environmental toxins and pollutants can have negative impacts on the microbiome and overall health. Further research is needed to understand the relationship between the microbiome and the environment, and to develop strategies to protect the microbiome and promote health. (Identifying specific environmental toxins and pollutants that affect the microbiome and the associated health outcomes, Identifying the mechanisms through which environmental toxins and pollutants affect the microbiome, Exploring the impacts of changes in land use and biodiversity on the microbiome, developing strategies to protect the microbiome and promote health).

**Objectives**

1. Discuss the role of the microbiome in human health and its relationship with the environment

2. Analyze the impact of environmental toxins and pollutants on the microbiome

3. Evaluate the effectiveness of interventions aimed at protecting the microbiome and promoting health

4. Develop critical thinking skills to analyze and interpret scientific literature on the microbiome and environmental health

5. Discuss the role of environmental justice in addressing microbiome and environmental health disparities.

**Learning outcomes**

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

1. explain the role of the microbiome in human health and its relationship with the environment

2. analyze the impact of environmental toxins and pollutants on the microbiome and its effects on human health

3. evaluate the effectiveness of interventions aimed at protecting the microbiome and promoting health

4. analyze and interpret scientific literature on the microbiome and environmental health, and communicate their findings effectively

5. explain the role of environmental justice in addressing microbiome and environmental health disparities and develop strategies to promote health equity.

**Course content**

The human microbiome and its role in health and disease. The impact of environmental toxins and pollutants on the microbiome. The effect of changes in land use and biodiversity on the microbiome. The impact of diet and lifestyle on the microbiome. The use of probiotics and prebiotics to protect the microbiome. The use of fecal transplants to restore the microbiome. The role of the microbiome in the development of chronic diseases. The impact of climate change on the microbiome. The role of the microbiome in cancer. The use of antibiotics and their impact on the microbiome. The impact of environmental toxins and pollutants on the gut microbiome. The use of microbiome-based therapies. The impact of urbanization on the microbiome. The impact of maternal and fetal microbiome. The impact of industrial agriculture on the microbiome. The role of environmental justice in protecting the microbiome.

**Minimum academic standards:**  As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 504 Understanding and Managing the Health Risks of Climate Change (2 Units, status C, LH 30)**

**Senate approved relevance**

The course will provide graduates with sufficient information and skills in the various health impacts of climate change, such as heat-related illnesses, air pollution, and the spread of infectious diseases. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

This course will cover the various health impacts of climate change, such as heat-related illnesses, air pollution, and the spread of infectious diseases. Students will learn about the scientific evidence linking climate change to these health impacts and the populations most vulnerable to these risks.

The course will also examine the role of public health interventions and policies in addressing the health impacts of climate change, such as heat warning systems, air quality regulations, and disease surveillance programs. Additionally, students will learn about the economic, social and ethical dimensions of climate change and health, as well as the importance of community engagement, and the role of health professionals in addressing the health risks of climate change.

**Objectives**

1. Discuss the health impacts of climate change and their relationship to environmental factors

2. Analyze the social and economic determinants that contribute to vulnerability to the health impacts of climate change

3. Evaluate the effectiveness of interventions and policies aimed at reducing the health risks associated with climate change

4. Develop critical thinking skills to analyze and interpret scientific literature on the health risks of climate change

5. Discuss the role of community engagement, health professionals and the ethical dimensions in addressing the health risks of climate change.

**Learning outcomes**

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

1. explain the health impacts of climate change and their relationship to environmental factors

2. analyze the social and economic determinants that contribute to vulnerability to the health impacts of climate change

3. evaluate the effectiveness of interventions and policies aimed at reducing the health risks associated with climate change

4. analyze and interpret scientific literature on the health risks of climate change and communicate their findings effectively

5. describe the role of community engagement, health professionals, and ethical dimensions in addressing the health risks of climate change and develop strategies to promote health equity.

**Course content**

The health impacts of climate change, such as heat-related illnesses, air pollution, and the spread of infectious diseases. The scientific evidence linking climate change to these health impacts and the populations most vulnerable to these risks. Public health interventions and policies to address the health impacts of climate change, such as heat warning systems, air quality regulations, and disease surveillance programs. The economic, social and ethical dimensions of climate change and health. The role of community engagement in addressing the health risks of climate change. The role of health professionals in addressing the health risks of climate change. The impact of climate change on vulnerable populations, such as the elderly and low-income communities. The impact of climate change on air quality and respiratory health. The impact of climate change on water-borne and vector-borne diseases. The impact of climate change on food security and nutrition. The impact of climate change on the spread of non-communicable diseases. The impact of climate change on emergency preparedness and response. The impact of climate change on global health security. The role of climate change adaptation in public health. The role of climate change mitigation in public health

**Minimum academic standards**: As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 505 Environmental Health Policy and Practice (2 Units, status C, LH 30)**

**Senate approved relevance**

The course will provide graduates with sufficient information and skills in the various environmental health concerns, such as air pollution, water pollution, and exposure to toxic chemicals, and the policies and regulations that address these concerns. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

This course will cover the various environmental health concerns, such as air pollution, water pollution, and exposure to toxic chemicals, and the policies and regulations that address these concerns. Students will learn about the role of government agencies, such as the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA), in protecting public health.

The course will also examine the intersection of environmental health with other fields, such as economics, law, and politics, and the impact of these intersections on policy decisions. Additionally, the course will cover the role of community engagement in environmental health policy and practice, as well as the role of public health professionals in advocating for policies that protect human health.

**Objectives**

1. Discuss the various environmental health concerns, such as air pollution, water pollution, and exposure to toxic chemicals

2. Analyze the policies and regulations that address environmental health concerns

3. Evaluate the effectiveness of policies and regulations in protecting public health

4. Develop critical thinking skills to analyze and interpret the intersection of environmental health with other fields, such as economics, law, and politics

5. Explain the role of community engagement and public health professionals in environmental health policy and practice.

**Learning outcomes**

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

1. explain the various environmental health concerns, such as air pollution, water pollution, and exposure to toxic chemicals

2. analyze the policies and regulations that address environmental health concerns

3. evaluate the effectiveness of policies and regulations in protecting public health

4. analyze and interpret the intersection of environmental health with other fields, such as economics, law, and politics, and communicate their findings effectively

5. describe the role of community engagement and public health professionals in environmental health policy and practice and develop strategies to advocate for policies that protect human health

**Course content**

Introduction to environmental health policy and practice. Air pollution control policies and regulations. Water pollution control policies and regulations. Chemical safety policies and regulations. Occupational health and safety policies and regulations. Climate change and public health policies. Environmental justice and health equity. Role of government agencies such as Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA). Economic and political considerations in environmental health policy. Legal frameworks for environmental health policy. Community engagement in environmental health policy. International environmental health policies. Environmental health policies and the Sustainable Development Goals (SDGs). Environmental health policies and the precautionary principle. Role of Public Health Professionals in environmental health policy advocacy. Impact of COVID-19 pandemic on environmental health policy. Future trends in environmental health policy and practice.

**Minimum academic standards:**  As contained in the NUC MAS.

**Bayero University, Kano**

**Faculty of Allied Health Science**

**Department of Environmental Health Science**

**B.EHS Environmental Health Science**

**BUK-EHS 506 Environmental Justice and Population Health (2 Units, status C, LH 30)**

**Senate approved relevance**

The course will provide graduates with sufficient information and skills in examining the relationships between environmental factors and health disparities among different population groups including social determinants of health and how they interact with the environment to produce health disparities. This is consistent with the university's vision and mission of providing leadership in research and education in Africa while also addressing African development challenges through cutting-edge research, knowledge transfer, and the training of high-quality graduates.

**Overview**

The course examines the relationships between environmental factors and health disparities among different population groups. This course will cover the historical and contemporary context of environmental justice, including the ways in which marginalized communities have been disproportionately affected by environmental hazards. Students will learn about the social determinants of health and how they interact with the environment to produce health disparities.

The course will also cover the various approaches and strategies to address environmental justice issues, such as community-based participatory research, health impact assessments, and policy advocacy. Additionally, the course will examine the intersection of environmental justice with other social justice issues, such as race, class, gender, and poverty.

**Objectives**

1. Explain the relationships between environmental factors and health disparities among different population groups

2. Analyze the historical and contemporary context of environmental justice and its impact on marginalized communities

3. Evaluate the various approaches and strategies to address environmental justice issues

4. Describe the social determinants of health and how they interact with the environment to produce health disparities

5. Discuss the intersection of environmental justice with other social justice issues, such as race, class, gender, and poverty.

**Learning outcomes**

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

1. explain the relationships between environmental factors and health disparities among different population groups

2. analyze the historical and contemporary context of environmental justice and its impact on marginalized communities

3. evaluate the various approaches and strategies to address environmental justice issues

4. explain the social determinants of health and how they interact with the environment to produce health disparities

5. describe the intersection of environmental justice with other social justice issues, such as race, class, gender, and poverty and apply it to real-world scenarios.

**Course content**

Introduction to environmental justice and population health. Historical and contemporary context of environmental justice. Environmental racism and health disparities. Environmental health and social determinants of health. Community-based participatory research in environmental justice. Health impact assessments and environmental justice. Environmental justice and policy advocacy. Environmental justice and climate change. Environmental justice and urbanization. Environmental justice and industrialization. Environmental justice and natural resources. Environmental justice and indigenous communities. Environmental justice and migration. Environmental justice and gender. Environmental justice and poverty. Environmental justice and COVID-19 pandemic. Intersection of environmental justice with other social justice issues, such as race, class, and gender.

**Minimum academic standards:** As contained in the NUC MAS.