THOMAS ADEWUMI UNIVERSITY OKO COURSE OUTLINE		
Faculty	Computing and applied science	
Department	Biological Sciences	
Course title	**VIROLOGY**	
Year of study	3	
Course code	MCB 301	
Credit hours	3	
Contact hours	45	
Mode of delivery	CLASSROOM LECTURES	
Mode of assessment		WEIGHT%
Continuous assessment		30%
Final examination		70%
Total		100%
Course lecturers and Instructors	MRS F.J. OLAITAN-LECTURER	
Course description	"Virology" is a comprehensive course that delves into the fascinating world of viruses, their structure, replication, interactions with host cells, and their significant impact on human health and other organisms. Through a combination of lectures, laboratory work, case studies, and discussions, students will explore the intricacies of virology, from the molecular level to the broader implications in medicine, biotechnology, and research. This course aims to equip students with a deep understanding of virological principles and their applications in various fields.	
Course objectives	This course will facilitate the understanding of: 1. The basic stages of the microbial growth curve 2. Factors that affect microbial growth 3. Types of microbial culture 4. Modes of nutrient uptake and Transport 5. Forms of metabolism with respect to the energy and carbon source an organism can utilize.	
Learning outcomes	By the end of the course, students will be able to: 1 Describe microbial growth in a sequential path. 2 Elucidate how each environmental factors influence microbial growth.	

	3 Define a microbial culture and describe the several types that are obtainable. 4 Classify microorganism according to the types of metabolism they undergo. 5 Describe the several pathways that microorganisms can function metabolically
Teaching and learning	The class will be taught for three hours a week.
Detailed course content	Introduction to Viruses, Discovery and Historical Background of Viruses, Nature and Definition of Viruses, Unique Properties of Viruses in Microbiology. Structure and Classification of Viruses, Structure of Viruses: Capsid, Envelope, Nucleic Acids, Isolation, Purification, and Cultivation of Viruses, Viral Taxonomy: Classification and Nomenclature, Study of Bacteriophages: Characteristics and Applications. Viral Replication and Multiplication, Viral Replication Strategies: Lytic and Lysogenic Cycles, Viral Multiplication in Host Cells: Attachment, Penetration, Uncoating, Interaction of Viruses with Cellular Receptors, Viral Transmission: Modes and Mechanisms. Viral Nucleic Acids and Genome Salient Features of Viral Nucleic Acids: DNA and RNA Genome Organization in Different Types of Viruses Viral Genome Replication: DNA and RNA Replication Mechanisms. Viruses and Cancer Viruses and Oncogenesis: Mechanisms and Significance Oncogenic DNA Viruses and Their Role in Cancer Oncogenic RNA Viruses and Their Impact on Cellular Regulation. Prevention and Control of Viral Diseases Antiviral Compounds: Modes of Action and Targeting Interferons: Role in Immune Response and Antiviral Defense General Principles of Viral Vaccination: Types and Mechanisms. Applications of Virology Use of Viral Vectors in Cloning and Expression Gene Therapy: Viral Vectors for Treating Genetic Disorders.

	Phage Display Technology: Applications in Research and Medicine Advances in Virology Research Viral Evolution and Zoonotic Diseases Role of Virology in Biotechnology and Therapeutics
Course content sequencing	
Weeks	
Week 1	Introduction to Viruses, Discovery and Historical Background of Viruses, Nature and Definition of Viruses, Unique Properties of Viruses in Microbiology, Microbial Growth Definition of microbial growth, Growth curve Measurement of microbial growth
Week 2	Structure and Classification of Viruses, Structure of Viruses: Capsid, Envelope, Nucleic Acids Isolation, Purification, and Cultivation of Viruses, Viral Taxonomy: Classification and Nomenclature, Study of Bacteriophages: Characteristics and Applications
Week 3	Viral Replication and Multiplication Viral Replication Strategies: Lytic and Lysogenic Cycles, Viral Multiplication in Host Cells: Attachment, Penetration, Uncoating Interaction of Viruses with Cellular Receptors Viral Transmission: Modes and Mechanisms
WEEK 4	Viral Nucleic Acids and Genome Salient Features of Viral Nucleic Acids: DNA and RNA, Genome Organization in Different Types of Viruses, Viral Genome Replication: DNA and RNA Replication Mechanisms
Week 5 & 6	Viruses and Cancer, Viruses and Oncogenesis: Mechanisms and Significance Oncogenic DNA Viruses and Their Role in Cancer, Oncogenic RNA Viruses and Their Impact on Cellular Regulation
Week 7 & 8	Prevention and Control of Viral Diseases Antiviral Compounds: Modes of Action and Targeting, Interferons: Role in Immune Response and Antiviral Defense, General Principles of Viral Vaccination: Types and Mechanisms

Week 9 & 10	Applications of Virology, Use of Viral Vectors in Cloning and Expression, Gene Therapy: Viral Vectors for Treating Genetic Disorders, Phage Display Technology: Applications in Research and Medicine
Week 11	Emerging Trends and Future Directions Advances in Virology Research Viral Evolution and Zoonotic Diseases Role of Virology in Biotechnology and Therapeutics
Week 12	Revision
Recommended reading material	

1. Edward P. Rybicki, (2023). Cann's Principles of Molecular Virology, 7th Edition - February 8, 2023
2. Mary Buchinger, Eileen Cleary, Martha McCollough 2022. Virology
3. Gregory J. (2022). Morgan Cancer Virus Hunters, A History of Tumor Virology
4. Warren Levinson, Peter Chin-Hong, Elizabeth A. Joyce, Jesse Nussbaum. (2022). Review of Medical Microbiology and Immunology, Seventeenth Edition
5. Joanne M. Willey, Kathleen M. Sandman (Author), Dorothy H. Wood (Author), Lansing M. Prescott (2020) 11^{TH} edition. McGraw-Hill, New York, NY, 2020

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Preamble: "Virology" is a comprehensive course that delves into the fascinating world of viruses, their structure, replication, interactions with host cells, and their significant impact on human health and other organisms. Through a combination of lectures, laboratory work, case studies, and discussions, students will explore the intricacies of virology, from the molecular level to the broader implications in medicine, biotechnology, and research. This course aims to equip students with a deep understanding of virological principles and their applications in various fields.

A. Specific course objectives/learning outcomes.

This course will facilitate the understanding of:

1. The basic stages of the microbial growth curve

2. Factors that affect microbial growth

3. Types of microbial culture

4. Modes of nutrient uptake and Transport

5. Forms of metabolism with respect to the energy and carbon source an organism can utilize.

B. Learning activities/Course delivery methods

C. Lectures: detailed content of course are taught in class

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