

THOMAS ADEWUMI UNIVERSITY OKO
COURSE OUTLINE

Faculty	Computing and applied science	
Department	Biological Sciences	
Course title	FERMENTED FOODS	
Year of study	4	
Course code	MCB 412	
Credit hours	2	
Contact hours	30	
Mode of delivery	CLASSROOM LECTURES	
Mode of assessment		WEIGHT%
Continuous assessment		30%
Final examination		70%
Total		100%
Course lecturers and Instructors	Dr. Adekemi T. Dahunsi-LECTURER	
Course description		
Course objectives	<p>This course provides students, an array of understanding in:</p> <ol style="list-style-type: none"> 1. the definition of fermentation, its biochemical basis, and its importance in food processing and preservation. 2. the wide range of fermented foods from various cultures, with emphasis on traditionally fermented foods in Nigeria and oriental fermentation practices. 3. the underlying principles of fermentation, including microbial involvement and biochemical transformations. 4. how fermentation processes contribute to food preservation and the creation of diverse food products. 5. how fermentation is utilized to produce enzymes, antibiotics, and single-cell protein for various food-related applications. 6. the concept of waste utilization through fermentation, emphasizing its sustainable and eco-friendly aspects. 	
Learning outcomes	By the end of the course, students will be able to:	

	<ol style="list-style-type: none"> 1. Describe the significance of fermentation in food processing, 2. Explain the historical background and cultural importance of fermented foods 3. Describe the biochemical principles underlying fermentation processes 4. Highlight how various fermented foods are explored from different cultures 5. Describe the significant traditional fermented foods in Nigeria 6. Explain oriental fermented food processing techniques and examples 7. Describe the principles and biochemistry of Fermentation 8. Explain microbial involvement and role in fermentation 9. State the biochemical transformations that occurs during fermentation 10. State the factors influencing the course of fermentation processes 11. Describe how food processing and preservation are done through fermentation 12. Describe enhancement of flavor, texture, and nutritional value in fermented foods 13. Mention popular fermented food products and their processing methods 14. Describe the role of fermentation in producing enzymes for food processing 15. Explain antibiotic production process through microbial fermentation 16. Describe the use of single-cell protein as a food and feed source 17. Describe how fermentation is used in Waste Utilization
Teaching and learning	The class will be taught for two hours a week.
Detailed course content	Definition and importance of fermentation. Principles and Biochemistry of fermentation. Fermented foods including traditionally fermented foods of importance in Nigeria. Oriental fermented food processing, operations involved in enzyme single cell protein, antibiotics and related fermentation processes in food processing and

	preservation. Application of fermentation in waste utilization.
Course content sequencing	
Weeks	
Week 1	Introduction to Fermentation Definition and significance of fermentation in food processing, Historical background and cultural importance of fermented foods Biochemical principles underlying fermentation processes
Week 2 & 3	Types of Fermented Foods Exploration of various fermented foods from different cultures, Focus on traditional fermented foods of significance in Nigeria, Oriental fermented food processing techniques and examples
Week 4	Principles and Biochemistry of Fermentation Microbial involvement and role in fermentation, Biochemical transformations during fermentation Factors influencing the course of fermentation processes
Week 5 & 6	Food Processing and Preservation through Fermentation, How fermentation contributes to food preservation, Enhancement of flavor, texture, and nutritional value in fermented foods, Examples of popular fermented food products and their processing methods
Week 7 & 8	Enzymes, Antibiotics, and Single-Cell Protein Production, Role of fermentation in producing enzymes for food processing, Antibiotic production through microbial fermentation, Single-cell protein as a food and feed source
Week 9 & 10	Fermentation in Waste Utilization Utilization of fermentation to convert waste into valuable products, Eco-friendly aspects of waste utilization through microbial processes, Examples of waste utilization projects involving fermentation
Week 11	Practical
Week 12	Revision
Recommended reading material	

1. Joanne Willey and Kathleen Sandman and Dorothy Wood (2020). Prescott's Microbiology. 11th Edition.
2. E. M. T. El-Mansi, Jens Nielsen, David Mousdale and Ross P. Carlson (2019). Fermentation Microbiology and Biotechnology, Fourth Edition
3. Richard K. Robinson (2002). Dairy Microbiology Handbook, the handbook of milk and milk products Dairy Microbiology Handbook: The Microbiology of Milk and Milk Products, 3rd Edition.

A. Course code: MCB 412

B. Course title: FERMENTED FOODS

Preamble: "Fermented Foods" course provides a comprehensive investigation into the science, principles, and practical implementations of fermentation within the realm of food processing and preservation. Through this course, students will attain a comprehensive understanding of the foundational principles governing fermentation, the underlying biochemical processes, and its pivotal role in diversifying the spectrum of food items. The curriculum extensively covers a broad range of fermentation techniques, encompassing both traditional practices and modern methodologies, with special emphasis on their significance within Nigeria and on a global scale. Moreover, the course critically examines how fermentation contributes to the production of essential components such as enzymes, single-cell protein, antibiotics, and the sustainable utilization of waste materials.

C. Specific course objectives/learning outcomes.

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

- 1: describe the significance of fermentation in food processing,
2. explain the historical background and cultural importance of fermented foods
3. describe the biochemical principles underlying fermentation processes
4. highlight how various fermented foods are explored from different cultures
5. describe the significant traditional fermented foods in Nigeria
6. explain oriental fermented food processing techniques and examples
7. describe the principles and biochemistry of Fermentation
8. explain microbial involvement and role in fermentation
9. state the biochemical transformations that occurs during fermentation
10. state the factors influencing the course of fermentation processes
11. describe how food processing and preservation are done through fermentation

12. describe enhancement of flavor, texture, and nutritional value in fermented foods
13. mention popular fermented food products and their processing methods
14. describe the role of fermentation in producing enzymes for food processing
15. explain antibiotic production process through microbial fermentation
16. describe the use of single-cell protein as a food and feed source
17. describe how fermentation is used in Waste Utilization

D. Learning activities/Course delivery methods: lectures and practicals

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

Course content: Definition and importance of fermentation. Principles and Biochemistry of fermentation. Fermented foods including traditionally fermented foods of importance in Nigeria. Oriental fermented food processing, operations involved in enzyme single cell protein, antibiotics and related fermentation processes in food processing and preservation. Application of fermentation in waste utilization.