

COURSE COMPACT

College: CSE

Department: Biological Sciences

Programme: Microbiology

Course Code: MCB 311

Units: 3

Course Title: Laboratory Practice in Microbiology

Course Lecturer: Dr. O. B. Akpor, Mrs. T.A. Adelani-Akande, Dr. M.O. Abolarin

Semester: Alpha

Time of Lecture: Tuesday 10am- 1pm

Location: Biology Lab

Brief Overview

A. Course Objective/ Goals

Students should be able to:

- a. Discuss on the need for aseptic techniques and perform basic aseptic techniques.
- b. Mention different types of microscope, explain the principles and state the functions of these microscopes.
- c. Describe the morphology of bacteria and recognize same under the microscope.
- d. Explain the principles behind at least four different staining techniques and perform Gram staining.
- e. Carryout isolation of microorganisms from soil and water samples.
- f. Determine the microbial population in a given sample.
- g. Undertake antibiotic sensitivity testing and determine minimum inhibitory concentration as well as minimum bactericidal concentration of such compound.
- h. Detect common parasites in a given sample.
- i.

B. Method of Lecture Delivery / Teaching

Practical sessions in the laboratory

Theoretical sessions to expose students to the topic.

Each module will last for two weeks.

C. Course Outline

Module	Title	Aim and Objectives
1	Introduction to the laboratory and Microscopy	Students will be introduced to the use of microscopes, the various types and their functions. Students should be able to know: <ul style="list-style-type: none"> a. Basic laboratory rules. b. Mention the functions of different types of microscope. c. How to transfer microscopes, position slides, obtain required magnification, and focus an object under the microscope from low power to high power objectives. d. Draw and recognize common shapes of bacteria.
2	Introduction to staining	To expose students to direct and indirect staining, Gram staining, capsule staining and acid fast staining emphasizing the principles behind each technique. Students should be able to: <ul style="list-style-type: none"> a. State procedures for at least four different staining techniques. b. Carryout Gram staining and explain the significance of all reagents required.
4	Microbial enumeration and quantification	To educate students on various approaches to microbial enumeration such as direct microscopic count, viable count, most probable number, ATP assay, electronic enumeration methods and spectroscopy. The student should be able to: <ul style="list-style-type: none"> a. Explain how to carry out pour plate and spread plate techniques. b. Determine the number of microorganisms in a given sample.
5	Microbial isolation and aseptic techniques	To examine in details the following: general aseptic techniques, pure culture techniques for fungi and bacteria as well as maintenance and preservation of microbial cultures Students should be able to: <ul style="list-style-type: none"> a. Discuss on the need for aseptic techniques and perform basic aseptic techniques. b. Isolate microorganisms from a given food sample. c. Perform serial dilution and streak. d. Store a microbial culture using agar slope.
6	Antibiotic sensitivity testing	Introduce students to agar dilution and disc dilution methods for antibiotic sensitivity testing as well as how to determine minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). Students should know: <ul style="list-style-type: none"> a. Basic procedure for carrying out both agar and disc dilution methods. b. Explain how to determine MIC and MBC.
7	Parasitology	Introduce students to the common parasites. Students should be <ul style="list-style-type: none"> a. Detect common parasites in a given sample.

D. Tutorials : This will be given as required by the class.

E. Structure of Programme/ Method of Grading

Fourteen (14) weeks of teaching and practical classes.

Practical sessions: 30%

Alpha semester exams: 70%

F. Ground Rules and Regulation

1. Follow all general laboratory rules
2. University requirements for attendance would be strictly followed.
3. Other requirements for the course include: laboratory notebooks, pencil, pen, laboratory coat, one roll of Petri dish and cotton wool.

G. Topic for Term Paper/ Assignment

This will be given were necessary.

H. Alignment with Goals and Vision of Landmark University

This course will awaken the passion for research in students there by empowering them to be solution providers as they begin to find practical ways to solve challenges facing the human race via application of microbiological techniques.

I. Contemporary Issues / Industry Relevance

Microbiology students are required to participate in the Students Work Experience Scheme after this semester, this course will equip students with necessary skills for effective performance.

J. Recommended Reading

1. All microbiology manuals and textbooks available at the Landmark University Centre for Learning Resources.
2. Laboratory Manual and Workbook in Microbiology Applications to Patient Care 7th Edition Josephine A. Morello Paul A. Granato Helen Eckel Mizer