



## COURSE COMPACT

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<b>Faculty:</b>	Faculty of Sciences
<b>Department:</b>	Microbiology
<b>Programme:</b>	B.Sc. Microbiology
<b>Course Code:</b>	MCB 121
<b>Course Title:</b>	<b>Basic Techniques in Microbiology</b>
<b>Units:</b>	3
<b>Course Lecturer:</b>	<b>Dr. (Mrs). Modupeade Adetunji</b>
<b>Semester/Session:</b>	Second
<b>Session:</b>	2018/2019
<b>Location:</b>	Lecture room

### A. Brief Overview of Course

Introduction to laboratory equipment and wares; functions, use and maintenance. Aseptic techniques. Stains, reagents and media. Isolation of bacteria, fungi and viruses from samples. Methods in microbial enumeration. Microscopy and non-cultural methods of demonstrating the presence of microorganisms. Standardization of bacterial inoculum. Preparation of pure cultures, methods of storage and preservation of cultures.

### B. Course Objectives/Goals

The course aims to introduce to the students the fundamental techniques in Microbiology. It will guide them on basic practices and conduct in the Microbiology laboratory. At the end of the course students are expected to:

- Have a knowledge of the basic Microbiology laboratory equipment, their function, usage and maintenance
- Know the aseptic techniques in Microbiology Laboratory
- Know the different stains, reagent and media used in the Microbiology Laboratory
- Understand the techniques of isolating microorganism from mixed microbial culture and also know how to estimate microbial population in a particular sample
- Know how to prepare and preserve pure cultures

- Be familiar with the use of the microscope and non-cultural methods of demonstrating the presence of microorganism and
- Have a knowledge of Standardization of bacterial inoculum

### **C. Methods of Lecture Delivery/Teaching Aids**

- Lecture Delivery Methods
  - Interactive classroom session
  - Individual assignments
  - Lecture notes
- Teaching Aids
  - Multimedia projection
  - Practical demonstration at the Microbiology laboratory

### **D. Course Outlines**

- Modules & Details of Topics

## **Module I: Introduction to Laboratory Equipment and Wares; Functions, Use and Maintenance**

### **(a) Week 1: Introduction to Laboratory Equipment:**

- Instruments required for Sterilization,
- Instruments and Tools required for isolation, culturing and maintenance
- Instruments and tools required for microbial observations and assays
- Glass wares and Miscellaneous items

**Week 2:** Practical Demonstration on usage, function and maintenance of equipment

**Module II:** Aseptic techniques.

**Week 3:** Aseptic techniques.

## **Module III: Stains, reagents and media**

**Week 4:** Introduction to different stains used in the Microbiology Laboratory

**Week 5:** Microbiological Reagents and Media

Continuous Assessment One (CA1)

**Week 6:** Introduction to different categories of Media

- General routine Media
- Differential and selective media
- Enrichment media etc.

**Module IV: Isolation of bacteria, fungi and viruses from samples**

**Week 7:** Methods of Isolating bacteria, fungi and viruses from samples

**Week 8:** Preparation of pure cultures, methods of storage and preservation of cultures.

**Mid-Semester Test**

**Week 9:** Methods of microbial Enumeration

**Module V: Microscopy and non-cultural methods of demonstrating the presence of microorganisms**

**Week 10:** Microscopy

- Introduction to different parts of the microscope and their functions
- Methods of fixing and staining of bacterium cell on slides
- Viewing under the microscope at varying magnifications and resolution
- Non-cultural methods of demonstrating the presence of microorganisms

Continuous Assessment Two (CA2)

**Week 11:** Standardization of bacterial inoculum

**Week 12:** Revision

**E. Structure of the Programme/Method of Grading**

- Continuous Assessment
    - Class test/Assignments 20% Marks
    - Mid Semester test 10% Marks
  - Examination 70% Marks
- TOTAL 100%**

**F. Ground Rules & Regulations**

- 75% attendance is required to sit for the examination.
- Assignments must be submitted as at when due.
- Contributions to group discussion and class work are noted.

**G. Topics of Term Papers/Assignment/Student Activities**

Isolation and Characterization of bacteria isolated from food sold at the University Cafeteria

## **H. Contemporary Issues/Industry Relevance**

The relevance of Microbiologist in the Industries, Environmental Agencies, Hospitals etc cannot be over emphasized. This course provides the basic foundation on routine practices in Microbiology laboratory which will prepare the students for future encounter as they progress in their field and also for the Industrial world.

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- Assignments must be submitted as at when due.
- Contributions to group discussion and class work are noted.

## **J. Recommended Reading/Texts**

- a) Bailey, W.R. and E.G. Scott. 1966. Diagnostic Microbiology, Second Edition. Toppan Company Ltd., Japan, 342 pp.
- b) Tonguthai, K., S. Chinabut, T. Somsiri, P. Chanratchakol and S. Kanchanakhan. 1999. Diagnostic Procedures for Finfish Diseases. Aquatic Animal Health Research Institute, Bangkok, Thailand.
- c) Sanders, E.R. Aseptic Laboratory Techniques: Volume Transfers with Serological Pipettes and Micropipettors. *J. Vis. Exp.* (63), e2754, doi:10.3791/2754 (2012).
- d) Ruangpan, L., & Tendencia, E. A. (2004). Bacterial isolation, identification and storage. In Laboratory manual of standardized methods for antimicrobial sensitivity tests for bacteria isolated from aquatic animals and environment (pp. 3–11). Tigbauan, Iloilo, Philippines: Aquaculture Department, Southeast Asian Fisheries Development Center. Philippines