



## LEAD CITY UNIVERSITY

### Faculty of Basic Medical and Applied Sciences

### Department of Microbiology

#### COURSE PARTICULARS

**Course code: MCB 211**

**Course Title: General Microbiology II**

**No. of Units: 3**

**Status: Compulsory**

#### LECTURER'S DETAILS

**Name: Prof. AO Adejuwon**

**Qualifications: B.Sc., M.Sc., Ph.D. (Microbiology) (Ife)**

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**Area of Specialization: Microbial Physiology and Metabolism**

**Name: OA Akintobi**

**Qualifications: B.Sc., M.Sc. (Microbiology) (Ife)**

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**Area of Specialization: Microbial Physiology and Metabolism, Mycology, Medicinal Plants**

**COURSE DESCRIPTION:** The course entails systematic classification of bacteria, fungi, viruses, chlamydia, rickettsia etc., microbial variation and hereditary, biological and biochemical reactions of microorganisms, cycles of elements in nature.

**COURSE OBJECTIVES:** The students will be exposed to the knowledge of:

1. Various groups of microorganisms, the general characteristics and classification of each group .
2. Microbial variation and heredity
3. Differential staining techniques
4. Various biochemical tests for identifying microorganisms particularly bacteria.
5. Relationship of microorganisms with nature as revealed in cycles of elements

### ASSESSMENT

Class Attendance	10 marks
Tests and Assignments	30 marks
Final Examination	60 marks

### LECTURE PLAN

Week	Topic
Week 1	Criteria for general classification Various groups of microorganisms Viruses, Mycoplasmas, Chlamydias, Rickettsias, Bacteria, Fungi, Algae and Protozoa
Week 2	Infectious agents smaller than virus-prions and viroids
Week 3	<i>Characteristics and classification of viruses, Chlamydias, Mycoplasmas and Rickettsias</i>
Week 4	Characteristics and classification of bacteria
Week 5	Biological and biochemical reactions of microorganisms II
Week 6	Biological and biochemical reactions of microorganisms II
Week 7	Microbial variation and heredity
Week 8	Characteristics and classification of <b>Fungi-Classes:</b> Myxomycetes, Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes I
Week 9	Characteristics and classification of <b>Fungi-Classes:</b> Myxomycetes, Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes II
Week 10	Characteristics and classification of <b>Algae-Classes:</b> Myxophyceae/Cyanophyceae, Euglenophyceae, Chlorophyceae, Bacillariophyceae, Rhodophyceae and Phaeophyceae I
Week 11	Characteristics and classification of <b>Algae-Classes:</b> Myxophyceae/Cyanophyceae, Euglenophyceae, Chlorophyceae, Bacillariophyceae, Rhodophyceae and Phaeophyceae II

<b>Week 12</b>	Characteristics and classification of <b>Protozoa-Subphyla:</b> Sarcomastigophora, Ciliophora, Sporozoa and Cindospora
<b>Week 13</b>	Characteristics and classification of <b>Protozoa-Subphyla:</b> Sarcomastigophora, Ciliophora, Sporozoa and Cindospora
<b>Week 14</b>	Cycles of elements in nature-Nitrogen cycle
<b>Week 15</b>	Revision and Tutorials

## READING LIST

1. Prescott, Harley, *Klein's Microbiology. Seventh edition.* Mc Graw Hill Inc., New York
2. Microbiology by Pelczar, Chan and Krieg, Tata Mc Graw Hill Inc., New York
3. Schaum's Outlines Theories and problems of Microbiology by Edward Akamo, 4th Edition
4. Fundamental Principles of bacteriology by AJ Salle, Tata Mc Graw Hill Inc., New York
5. Textbook of Botany-Diversity of Microbes and Cryptogams by Singh, Pande and Jam, 3rd edition
6. Life of Invertebrates by SN Prasad, Vikas Publishing PUT Ltd, India
7. Invertebrates Zoology by Barnes RD Sanders, Philadelphia
8. Invertebrates Structure and Functions by EJW Barrington (ELBS), The Camelot Press Ltd, Southampton
9. Jawetz, Manick and Adelberg's Medical Microbiology by Brooks GF, Butel JS, and Morse SA. 2004. 23rd edition
10. The Fungi- 2<sup>nd</sup> Edition by Sharma PD. 2004. Rakesh Kumar Rastogi, India
11. Botany for degree students by A.C Dutta

## TUTORIAL QUESTIONS

### **Part A:**

1. Enumerate and discuss the criteria which are generally used for the classification of bacteria
2. Apart from viruses, discuss the general characteristic features of the other four major groups of microorganisms, citing two examples in each group
- 3a. Give a detailed account of the "bacterium"
- b. Using a **table**, state the differences between the cell wall of Gram positive bacteria and Gram negative bacteria

4. Enumerate the composition of a bacterial capsule and discuss each in relation to virulence
- 5a. State the general characteristics of the viruses?
- b. Enumerate the criteria used in the classification of viruses?
6. Distinguish between the Poxviridae and the Retroviridae

**Part B:**

- 7a. Enumerate the reasons why some microorganisms are called Algae
- b. Describe any six characteristic features of the members of the Class Cyanophyceae
8. With the aid of large labeled diagrams only, show the structural differences between a *Chlamydomonas species* and an *Euglena species*
- 9a. Enumerate the various usefulness of the brown algae (Kelps) to man
- b. Of what economic importance is the "Diatomaceous earth" to man?
- c. List any four special characteristics of the members of the Class Bacillariophyceae
- 10a. List the four subphyla that comprise the Phylum Protozoa
- b. Enumerate the characteristic features of the members of the Phylum Protozoa
- c. Which Order does each of the following organisms in the Phylum Protozoa belongs to:
  - i. *Euglena viridis*
  - ii. *Chlamydomonas reinhardtii*
  - iii. *Trichomonas vaginalis*
    - i. *Amoeba proteus*
    - ii. *Plasmodium falciparum*
    - iii. *Paramecium caudatum*
- 11a. In what ways are the following Protozoans differ from one another?
  - (i) *Amoeba proteus*
  - (ii) *Paramecium caudatum*

**NB: Use labeled diagrams only**
- b. Mention the Class to which each of them belongs?
12. Use annotated diagram to describe Nitrogen Cycle