



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY
SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
EDUCATION SCIENCE AND BACHELOR OF SCIENCE WITH IT
3rd YEAR 1st SEMESTER 2023/2024 ACADEMIC YEAR
MAIN CAMPUS - REGULAR

COURSE CODE:	SBB 9305
COURSE TITLE:	GENERAL MICROBIOLOGY
EXAM VENUE:	STREAM: (BED)
DATE:	EXAM SESSION:
TIME: 2 HOURS	

Instructions:

- 1. Answer ALL questions in Section A and Any two questions in Section B**
 - 2. Candidates are advised not to write on question paper**
 - 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**
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SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. State three applications of microbiology in agriculture (3 marks)
2. Distinguish between lophotrichous and amphitrichous flagellation in bacteria (3 marks)
3. Explain the functions of the following components of the bacterial structure
 - i) Pili (1 mark)
 - ii) Fimbriae (1 mark)
 - iii) Plasmid (1 mark)
4. Use appropriate diagrams to distinguish between three forms of viral capsids (3 marks)
5. Outline the procedure for differentiating gram positive from gram negative bacteria (3 marks)
6. State three adaptations of bacteria to temperature requirements (3 marks)
7. State three differences between Sarcodina and Ciliophora classes of Protozoa (3 marks)
8. Explain the following techniques of culturing microbes
 - i) Pour plate (1½ marks)
 - ii) Streak plate (1½ marks)
9. State three differences in cell wall structure of Gram positive and Gram negative bacteria (3 marks)
10. Name the selective agent in the following microbiological culture media
 - i) McConkey agar (1 mark)
 - ii) Lowenstein-Jensen agar (1 mark)
 - iii) Sabourauds' agar (1 mark)

SECTION B: ESSAY QUESTIONS (20 MARKS)

11. Discuss replication and multiplication in bacteriophage viruses (20 marks)
12. Describe the different classes of microbiological culture media (20 marks)
13. Discuss the physical and chemical agents of microbial control (20 marks)
14. Discuss microbial growth in a batch culture of nutrients (20 marks)

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DEPARTMENT OF BIOLOGICAL SCIENCES**

SPB 9305: GENERAL MICROBIOLOGY

42 HOURS

COURSE OBJECTIVE

By the end of the course, the learner should be able to describe the basic features of microorganisms, perform basic laboratory techniques in microbiology and outline their control strategies.

EXPECTED LEARNING OUTCOMES

1. Explain the microbiology and structure of bacteria
2. Distinguish between prokaryotes and eukaryotes
3. Explain the nature and types of microorganisms
4. Describe the structure and replication
5. of bacteriophages
6. Explain the types, preparation and sterilization of microbiological growth media
7. Describe the methods of isolation and culture of microorganisms
8. Outline staining and microscopic examination procedures
9. Describe bacterial differentiation and morphological diversity
10. Describe the environmental factors that influence microbial growth and nutrition
11. Explain ecological relationships between microorganisms
12. Describe the microbial control strategies

COURSE DESCRIPTION

The microbiology and structure of bacteria emphasizing differences between prokaryotic cells; brief descriptions of nature and types of microorganisms; isolation, culture staining, microscopic examination, identification and classification of bacteria, bacterial growth and nutrition, effects of environmental factors on bacterial growth and survival, bacterial differentiation and morphological diversity, ecological relationships of prokaryotes, sterilization methods, the structure and replication of bacteriophages, sterilization methods, control of microorganisms.

TEACHING METHODS

Lecture hours per week – 2

Practical hours per week - 2

EXAMINATION

CATS & Practicals – 30%

Exam - 70%

REFERENCES

1. **Talaro K.P.**, (2008). Foundations in Microbiology: Basic Principles.6th Ed. McGraw-Hill, N.Y
2. **Nester E. W.** (2004). Microbiology- A human perspective. 4th Ed McGraw-Hill, N.Y
3. **Perry J.J.** (2002). Microbial Life. Sinauer Associates Publishers. Sunderland, Massachusetts, U.S.A
4. **Ronald M. Atlas.**, (1995). Principles of Microbiology - 1st Ed. Von Hoffmann Press, Inc. U.S.A

LECTURER: DR. ONYANGO B. O.