SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: BIO-250

OFFICE HOURS:

COURSE TITLE: Microbiology

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: BIO-116 OR BIO-211

CREDITS: 4

COURSE DESCRIPTION:
Microbiology is a course designed for the following programs: Cooperative Nursing, Respiratory Care, Medical Assisting, and SAM-Biology option. In this course students
study the principle of microorganisms and how they cause human disease. Specifically, this course covers the anatomy of microorganisms and their use in biotechnology,
characteristics of viruses, antimicrobial drugs and contribution of microorganisms to human diseases (effects on the immune system, lymphatic system, nervous system,
respiratory system, digestive system, urinary system and the reproductive system).

STUDENT LEARNING OUTCOMES:
Upon completion of this course, the following objectives will be achieved:

1. Identify and classify microorganisms
2. Comprehend the importance and apply safety and aseptic techniques in labs and healthcare
3. Explain how atoms form molecules and chemical bonds
4. Compare the size, shape, and arrangement of prokaryotic and eukaryotic cells using the microscopes to identifying and classifying microorganisms
5. Differentiate between the different microbial metabolic reactions & Analyze the different requirements for microbial growth and explain the factors that affect this growth
6. Identify the structure, function of the microbial genetic material and the regulation of gene expression
7. Compare the different tools of biotechnology used in experiment, analyze the different methods of classifying and identifying microorganisms
8. Differentiate and compare gram positive and gram negative bacteria
9. Compare and contrasts the characteristics of fungi, algae, protozoa and helminthes
10. Define the characteristics and structure of viruses, their mechanism of replication and transforming normal cells.
11. Discuss the different actions of antimicrobial drugs, the mechanism of resistance and microbial mechanisms of pathogenesis

12. Differentiate between different microbial diseases affecting the immune system & describe adaptive and innate immunity and defenses of the host
13. Distinguish between different microbial diseases of the skin and eye, nervous, cardiovascular, lymphatic, the upper and lower respiratory system, the digestive system, the urinary and reproductive system
14. Define selective media and explain its effect on bacterial growth and test the effect of different environmental factors on microbial growth
15. Experiment and discuss how to identify an unknown microorganism

TEXTBOOK AND SUPPLEMENTAL MATERIALS:

TEXTBOOK: Tortora, Funke and Case; Microbiology; An introduction 11th edition, Pearson. ISBN-13: 978-0321796677, ISBN-10: 0321796675 Edition: 11th

Required Lab Manual Information: Leboffe M. and Pierce B.: Microbiology; Laboratory Theory &Application 2nd edition; Morton Publisher ISBN 9781617312021 2nd edition

GRADING POLICY:

Two Lecture Exams	10% each
Two Lab Exams	10% each
Lab Reports	10%
Midterm	25%
Final Exam	25%

Attendance & Make Up Exams. Students are expected to follow attendance guidelines as presented in the syllabus provided by the instructor. However, in case of an emergency or illness, students are advised to notify their instructor or counselor immediately. The instructor will determine the validity of the absence. The exceptions to instructor discretion exist when members of armed forces are called for training or assignment or any case where students are legally required to be elsewhere. Pending the submission of appropriate documentation reasonable accommodations for make-up work shall be provided, and in accordance with guidelines included in the syllabus. Make up exams will be given only in extenuating circumstances. It is your responsibility to let me know that you missed an exam. All make up exams are more difficult than the original.

Attendance, punctuality and participation are required. Students missing more than 2 classes may receive a filing grade. Cell phones should be turned off in the classroom.

Lab Format: Unless indicated otherwise, each laboratory exercise is set up for team of four-five students. Each student on the team is to participate in every aspect of the lab exercise. After each exercise, a formal lab report is handed in for grading. The lab reports are written (word processed) individually, not as a team, and handed in during the next lab session. You are required, by department

policy, to follow all safety procedures. Each lab team is responsible for cleaning up their work area after every lab.

SAMPLE COURSE SCHEDULE:

Week #	**Lecture Topic**	**Lab Topic**
1	Introduction to the Course The Microbial World and You: naming and classifying microorganisms	Lab Safety Rules Aseptic techniques
2	Chemical Principles & Classification of microorganisms	Inoculation Methods
3	Functional Anatomy of Prokaryotic and Eukaryotic Cells	Introduction to Light Microscopes & Simple Stain
4	The Prokayotes: Domains Bacteria and Archaea	Gram Stain
5	**Exam 1** Microbial Growth	**Exam 1**
6	Microbial Genetics	Microbial Growth- part 1
7	Biotechnology and DNA technology	Microbial Growth- part 2
8	Microbial Metabolism	Differential and Structural Stain- Part 1
9	Viruses, Viroids, and Prions	Differential and Structural Stain- Part 2
10	**Exam II** Microbial Mechanisms of Pathogenesis	**Exam II**
11	Antimicrobial Drugs	Selective Media
12	Adaptive and Innate Immunity and Host Defense	Differential Tests
13	Microbial Diseases affecting Various Human Systems	Antimicrobial Drugs and Bacteria Growth
14	Review & Presentations	**Lab Exam –** Identification of unknown
15	**Final Exam**	

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