**SYLLABUS**

**COURSE # AND TITLE:** BIOL 224, Microbiology
**# OF CREDITS**: 4 (3+3P)

CATALOG DESCRIPTION
This course is an introductory survey of microorganisms. It is not limited to the study of bacteria, but will also cover protistans and fungi of medical and environmental importance. Within this context principles of isolation, taxonomy, ecology and physiology will be covered. Prerequisites: BIOL 121 or BIOL 122.

Semester Offered: Fall, Spring and Summer
Prerequisites: Reading: CPT score of 58 or better or successful completion of RDNG 095; English: CPT score of 70 or better or successful completion of ENGL 099; Math: CPT score of 66 or better or successful completion of MATH 095.

*Common Student Learning Outcomes*
*Upon successful completion of San Juan College programs and degrees, the student will....*

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| *Learn* | *Students will actively and independently acquire, apply and adapt skills and knowledge to develop expertise and a broader understanding of the world as lifelong learners.* |
| *Think* | *Students will think analytically and creatively to explore ideas, make connections, draw conclusions, and solve problems.* |
| *Communicate* | *Students will exchange ideas and information with clarity and originality in multiple contexts.* |
| *Integrate* | *Students will demonstrate proficiency in the use of technologies in the broadest sense related to their field of study.* |
| *Act* | *Students will act purposefully, reflectively, and respectfully in diverse and complex environments.* |

**GENERAL LEARNING OBJECTIVES**

Upon completion of the course, the student should understand the following content areas:
1. basic cell structure and function
2. cellular metabolism, particularly as it pertains to microorganisms
3. taxonomy of microorganisms
4. host-microbe interactions and the disease process
5. identification of microbes based on microscopic examination and biochemical tests
6. review of peer-reviewed literature

**SPECIFIC LEARNING OUTCOMES**

Upon successful completion of the course, the student will be able to:

1. know important contributors and contributions to the early study of microbiology;
2. describe and identify bacterial cell morphology;
3. list the structure and function of important prokaryotic and eukaryotic cellular components;
4. compare and contrast aerobic respiration, anaerobic respiration, anaerobic
5. fermentation, and be able to summarize major biochemical pathways including starting and ending compounds;
6. compare and contrast oygenic and anoxygenic photosynthesis;
7. list elements important for microbial growth;
8. compare and contrast prokaryotic cell growth with eukaryotic cell growth;
9. diagram and explain a bacterial growth curve;
10. describe methods of bacterial quantification;
11. summarize DNA replication, transcription, and translation;
12. understand processes specific to bacterial genetics such as DNA repair and the Ames test;
13. compare and contrast transformation, transduction, and conjugation;
14. describe taxonomic classifications of microorganisms;
15. examine eukaryotic microorganisms including morphology and life cycles;
16. examine viral morphology and describe viral life cycles;
17. examine the modes of action for common antibiotics;
18. compare and contrast broad and narrow spectrum antibiotics;
19. define, compare and contrast symbiosis, mutualism, and parasitism;
20. examine basic microbial pathogenicity;
21. identify the normal flora of the human body
22. identify the causative agent of a disease using Koch's postulates;
23. describe the course of an infectious disease;
24. define epidemiology and public health;
25. examine ways in which microorganisms are beneficial to the environment and humans;
26. demonstrate a basic understanding of microbiological media types and usage;
27. correctly use and care for the microscope;
28. learn the use, care and sterilization of laboratory equipment, including inoculating loops, Bunsen burners, and incubators and autoclave;
29. use diagnostic media and keys for the determination of unknown bacteria;
30. locate and evaluate literature available in libraries, guides to journals and on-line data bases

Syllabus developed by _____ Date: _____

Syllabus reviewed by _____ Date: _____

**A current syllabus must be on file in the dean's office for every course being taught during a given semester**