

BIOLOGY III (STS)
INTRODUCTION TO MICROBIOLOGY
COURSE SYLLABUS FOR CLASS AND LAB

Microbiology an Introduction
Seventh Edition
Tortora, Funke, and Case

Course Objectives:

- P • To provide a program in Biology that is lecture and laboratory based.
- P • Introduction to Microbiology. Basic principles and Applications of Microbiology.
- P • Scientific Method and scientific processing.
- P • Cognitive thinking skills.
- P • Applied academics, careers in science.
- P • Research skills/ Students will be doing at least one research paper per 4 week period.
- P • Individual experiments: Students will develop experiments based on information gathered from class.
- P • History of Disease
- P Study of the Immune system and immune response
- P Scope of Microbiology
- P Microbiology Today
- P Aerobic vs. Anaerobic organisms(metabolisms and treatments)
- P Nutritional Classes of Microorganisms
- P How microorganisms grow and nutritional needs
- P Methods of Microbial Classification
- P Bergey's Manual Scheme of Bacterial Taxonomy
- P Measuring numbers of Microorganisms
- P Turbidity
- P Dry Weight
- P Metabolic Activity
- P Direct Count
- P Plate Count
- P Filtration
- P Physical Controls on Microorganisms
- P Chemical Controls on Microorganisms
- P Preserving of Food
- P • Students will become more familiarized with the field of Microbiology, basic principles and applications.
- P • Ability to relate Microbiology to everyday life.
- P • Establish the importance of microbes in regards to infectious disease as well as the control of microbes.
- P • Immune system and the Immune response.
- P • CDC/USAmrid
- P • Disease in third world countries and organizations that work in regards to outbreaks.
- P • Learn about Incubator/ Autoclave, and the preparation of various growth media.
- P • Proper collection techniques of specimen.
- P • Proper plating, etc. of specimens.
- P • General staining as well as Gram staining techniques.
- P • Use of various media / techniques to Identify unknowns.
- P • Use of API 20E to Identify Enterobacteriaceae and other gram-negative rods.
- P Parkview Microbiology Lab Field trip, illustrating the culturing, identification, antibiotic indications, diagnosis of disease as a result of microbial infection.
- P Biochemical agents. (Colorado Dept. of Health Biochemical agents) (Guest speaker/ current events)
- P Virology (students will use flu kits to determine the presence of Influenza A or B (these kits are provided by Parkview Microbiology Lab / Lana Fairbanks.

- P Students participate as “Physicians” in the Ellis Island experience (Use universal methods in checking for disease) (students study diseases of that era and have a strong knowledge base.)
- P Basic Parasitology / dissection of *Ascaris lumbricoides*.

This course will consist of both lecture and laboratory experiences.

Students may have to spend time outside of class in order to complete projects. Please make arrangements so that I may make myself available.

Colorado State Standards as well as School Dist. 60 Standards will be met.

Standard 1:

Standard 2.1/ benchmark c

Standard 3.1/ benchmark a

Benchmark b

benchmark c

Standard 3.2 / benchmark b

benchmark d

Standard 3.3 / benchmark a

benchmark c

Standard 3.3 / benchmark d

benchmark e

Standard 3.4 / benchmark d

The Scientific method.

Separate substances based on chemical properties.

Use and produce classification systems

Predict and describe interactions in ecosystems.

explain how adaptations allow organisms to determine place in ecosystems.

catabolic and anabolic rx. in organisms energy use for maintenance of organism.

prokaryote vs. eukaryote structure/ function.

human body functions in regards to organ systems, specialized structures that maintain or restore health (Immune System and function)

treatments for various types of medical problems in relation to microbial infection.

patterns and processes in reproduction.

mutation and natural selection

COURSE OUTLINE/ SCOPE AND SEQUENCE

- A. Review Immune system/ function.
- B. Brief history Microbiology/Spon. Gen./ Germ theory/ Koch's pos.
- C. Introduction to Autoclave/ Incubator/ Media Preparation
- D. Aseptic technique
- E. Proper specimen collection
- F. Review structure of prokaryote/bacterial cell
- G. Basic staining techniques
- H. Gram staining technique
- I. Eubacteria vs. Archaeobacteria/ classification and various species
- J. Specific organisms and diseases caused/ treatments
- K. Identification of antimicrobial agents and what they destroy:
 - a. cell wall
 - b. cell membrane

- c. nucleic acids
- d. protein synthesis
- e. folic acid
- f. etc.

- L. Case studies/ Parkview Hospital Microbiology Lab
- M. Identification of Unknown Organisms
- N. Creation of New Species of Bacteria
- O. Microbial Interactions
- P. Microbes and Disease
- Q. Preventative measures of Microbial infections and spreading of disease.
- R. Skin and ear infections
- S. Eye and mouth infections
- T. Infections of the respiratory system
- U. GI infections
- V. Urinary tract infections
- W. Septicemia/ blood infections
- X. CNS infections
- Y. Parasites/Flatworms/Roundworms/Characteristics/Reproduction/Infection/Pathogenicity/Treatment.
- Z. Viruses/Shapes/ DNA vs. RNA viruses/ Structure/Reproduction/Infection/Pathogenicity/Treatment.
- AA.** Fungi/Characteristics/Structure/Reproduction/Infection/Pathology/Treatment

Grading Scale	93%-100%	A
	86%-92%	B
	79%-85%	C
	72%-78%	D
	71% and below	Fail

Tests equate to 25% of grade

Quizzes 10%

Labs

And Practicals 25%

Class work 10%

Final Exam 30%

Quizzes occur at least 1 time per week.

Tests will be at the end of each unit and all students are required to take the final exam.

We will have a minimum of 1 lab per week. Please refer to the rubric given in order to format lab write up and meet expectations.