

**MICRO 60 Course Outline as of Fall 2017****CATALOG INFORMATION**

Dept and Nbr: MICRO 60      Title: FUNDMTL MICROBIOLOGY  
 Full Title: Fundamentals of Microbiology  
 Last Reviewed: 1/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Survey of the major concepts of microbiology with emphasis on those related to infectious disease. Basic techniques for cultivation and identification of microorganisms.

**Prerequisites/Corequisites:**

Completion of BIO 10 or higher (V7) and Completion of CHEM 60 or higher (V6)

**Recommended Preparation:**

Course Completion of ENGL 1A

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Survey of the major concepts of microbiology with emphasis on those related to infectious disease. Basic techniques for cultivation and identification of microorganisms. (Grade or P/NP)

Prerequisites/Corequisites: Completion of BIO 10 or higher (V7) and Completion of CHEM 60 or higher (V6)

Recommended: Course Completion of ENGL 1A

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
<b>CSU GE:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	B2	Life Science	Fall 1981	
	B3	Laboratory Activity		
<b>IGETC:</b>	<b>Transfer Area</b>		Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:
<b>UC Transfer:</b>		Effective:		Inactive:

**CID:**

**Certificate/Major Applicable:**

Major Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon successful completion of this course, students will be able to:

1. Define microorganism and categorize microbes by domain and kingdom.
2. Describe the history of the discovery of the microbial world.
3. Relate microbial causality of disease to Koch's Postulates.
4. Describe the basic chemical activities essential to life.
5. Describe the structure of prokaryotic and eukaryotic cells.
6. Contrast genetic mutation, recombination, conjugation, transformation, and transduction.
7. Describe viruses and their relationships to cells and vaccines.
8. Compare various mechanisms of pathogenicity.
9. Describe the function of the immune system and its relation to disease.
10. Relate environmental influences on host resistance to public health measures.
11. Perform basic microbiological laboratory techniques.

### **Topics and Scope:**

- I. History of Microbiology
  - A. Discovery, microscopy, staining
  - B. Koch's Postulates and causality
  - C. Scientific method as it applies to microbiology
- II. Unity of Life
  - A. Cells and chemistry
  - B. Structure and function of nucleic acids
  - C. Structure and function of proteins
  - D. Energy metabolism
  - E. Prokaryotes and eukaryotes
  - F. Antibiotics and selective toxicity
- III. Taxonomy and Identification

- A. DNA based methodologies
- B. Epidemiology
- C. Select normal flora and pathogens
- IV. Microbial Genetics
  - A. Mutation and recombination
    - 1. Plasmids, conjugation, transduction, transformation
    - 2. Biotechnology
  - B. Antibiotic paradox
- V. Viruses
  - A. Discovery and definitions
  - B. Interactions with host cell
  - C. Anti-viral vaccination and chemotherapy
  - D. Retroviruses, HIV disease, cancer
- VI. Host's Role in Disease
  - A. Symbiosis
  - B. Non-specific resistance
  - C. The immune system and immunization
  - D. Environmental influences on host resistance
- VII. Lab exercises
  - A. Laboratory safety and sanitation
  - B. Laboratory techniques
    - 1. Aseptic techniques
    - 2. Bacterial culture (liquid and solid medium)
    - 3. Microscopy and staining techniques
    - 4. Preparation and sterilization of media
    - 5. Analyses of bacteria in water samples and on the human skin
    - 6. Antibiotic sensitivity
    - 7. Metabolic tests and bacterial identification
    - 8. ELISA (enzyme-linked immunosorbent assay)
    - 9. Identification of unknown bacteria

### **Assignment:**

#### Lecture Related Assignments:

1. Reading assignments from text, averaging one chapter per week; additional reading assignments averaging 5-10 pages per week
2. Research paper
3. Examinations: 3 midterms and a final exam
4. Quizzes (0-15)
5. Concept map assignment

#### Lab Related Assignments:

1. Lab practical exams (2)
2. Laboratory experiments, data collection, demonstration of sterile and culture technique; lab skills may also be assessed by performance in the identification of an unknown bacteria
3. Laboratory report: involves description of process student undertakes to identify unknown bacteria

### **Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Laboratory report, Research paper

Writing  
10 - 20%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Concept map

Problem solving  
0 - 5%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Laboratory experiments, data collection, demonstration of sterile and culture technique

Skill Demonstrations  
0 - 10%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, Examinations (multiple choice, completion; objective and essay questions)

Exams  
80 - 90%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None

Other Category  
0 - 0%

### **Representative Textbooks and Materials:**

Microbiology: An Introduction. 12th ed. Tortora, Gerard and Funke, Berdell and Case, Christine. Pearson. 2015

Microbiology: A Systems Approach. 4th ed. Cowan, Marjorie. McGraw-Hill. 2014

Instructor prepared lab manual