

COURSE SYLLABUS

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| LAST REVIEW | Spring 2021 |
| COURSE TITLE | Microbiology Laboratory |
| COURSE NUMBER | BIOL-0262 |
| DIVISION | Math, Science, Business & Technology |
| DEPARTMENT | Biology |
| CIP CODE | 24.0101 |
| CREDIT HOURS | 2 |
| CONTACT HOURS/WEEK | Lab: 4 |
| PREREQUISITES | CHEM0109, General Chemistry and Lab, or CHEM0111, College Chemistry I and Lab, or BIOL0121, General Biology or BIOL-0135, Cell and Molecular Biology; or BIOL0271, Physiology or BIOL0261, Microbiology |
| COREQUISITES | BIOL0261, Microbiology |
| COURSE PLACEMENT | Students must meet the correct placement measure for this course. Information may be found at: https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html |

COURSE DESCRIPTION

Using scientific procedures and diagnostic techniques, students investigate and perform laboratory work dealing with pathogenic and non-pathogenic microbes.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

I. Microscopy

- A. Parts of the medical grade compound light microscope
- B. Proper care of the microscope
- C. Resolution Power
- D. Refractive Index
- E. Magnification of Objective lenses
- F. Total Magnification
- G. Depth of Field
- H. Parfocalization
- I. Other types of microscopes
- II. White Blood Cell Counts
 - A. Identify erythrocytes
 - B. Identify thrombocytes
 - C. Identify five types of leukocytes and count 50
- III. Bacterial Morphology
 - A. Identify and draw two types of cocci arrangement morphologies
 - B. Identify and draw two types of bacilli arrangement morphologies
 - C. Identify and draw two types of spirilla
- IV. Environmental Study - Pond Water
 - A. Identify and draw various types of protozoans - relation to sustainability
- V. Bacterial Stains
 - A. Gram Stain
 - B. Endospore Stain
 - C. Capsule Stain
 - D. Acid Fast Stain
 - E. Cell Wall Stain
 - F. Simple Stain of cheek epithelial cells
- VI. Bacterial Cultures
 - A. Aseptic Technique
 - B. Streak Plating on nutrient agar
 - C. Colony Characteristics
- VII. Practical Application in Microbiology
 - A. Milk Dilution Assay
 - B. Pharmacological Agents
 - C. Ultraviolet Light
 - D. Disinfectants
 - E. Indoor environmental study of bacteria – relation to sustainability
 - F. Determination of Bacterial Unknown
 - G. Transformation with *Escherichia coli*
- VIII. Biochemical Testing of Bacteria
 - A. Blood Agar
 - B. MacConkeys agar
 - C. Mannitol Salts agar
 - D. Eosin Methylene Blue agar
 - E. Triple Sugar Iron agar

- F. Urease Test
- G. Indole Test
- H. Hydrogen Sulfide
- I. Motility
- J. Nitrate Test as related to recycling nutrients & sustainability
- K. Methyl Red test
- L. Citrate utilization

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will:

- A. Be able to focus a microscope on low-power and high-power
- B. Be able to focus a microscope using oil immersion.
- C. Be able to microscopically identify three types of bacterial morphology.
- D. Be able to microscopically identify microorganisms in pond water.
- E. Be able to conduct various bacterial stain procedures and identify microscopically.
- F. Be able to isolate pure cultures of bacteria on nutrient agar.
- G. Be able to conduct experiments used in applied workplace microbiology.
- H. Be able to perform biochemical tests used to identify bacteria.

ASSESSMENT OF COURSE LEARNING OUTCOMES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.