

# Microbiology Lab

8 Modules / Credit-by-Course / Credits 1

## Course Description:

This stand-alone lab course can be used alongside a Microbiology lecture. This lab course initiates the application of Microbiology by having students complete virtual laboratory simulations, directed by step-by-step instructions that mirror real life experiments. Course learning objectives and lab methodologies are explored through the use of in-lab evaluation questions. Microbiology is a lab course intended for students interested in learning about the microbial world and how the microbial world influences human actions and interactions. Specific topics covered include Laboratory Safety, Virtual Microscopy, Diversity of Microorganisms, Utilization and Application of the Aseptic Technique, Gram Staining, Acid-fast Staining, Bacterial Smear Sample Preparation, Bacterial Isolation Methods, Influences of Environmental Factors on Microbial Growth, Ubiquity of Microorganisms, Antiseptics & Disinfectants, and Kirby-Bauer Testing.

- This lab course is not intended for Allied Health majors.

## Course Outcomes:

After completing this course, you will be able to:

- Apply correct safety standards.
- Correctly utilize laboratory equipment (such as a virtual brightfield microscope) and stains (such as Crystal Violet and Gram's Iodine) as indicated.
- Communicate results of scientific investigations, analyze data, and formulate conclusions.
- Compare, contrast, and categorize the diversity of microorganisms.
- Administer the aseptic technique virtually and recognize why it is necessary in a lab setting.
- Distinguish between various bacterial isolation methods and identify how they are used.
- Recognize and complete microbial laboratory techniques and evaluate when to use certain techniques.
- Identify, distinguish, and apply how environmental factors including temperature, pH, availability of oxygen, and osmotic pressure affect microbial growth.
- Identify and demonstrate virtually the ubiquity of microorganisms.
- Recognize and apply how antiseptics, disinfectants, and antibiotics are used to control microbial growth.

## E-Book:

Title: Cowan's Microbiology: A Systems Approach 7th edition, McGraw Hill Education (Textbook reading is not required for this course; however, if you need information on topics covered, you can use the textbook above. )

## Open Education Resources (OER's)

If you are struggling with a term or concept, you can utilize the links below to search for the concept or term to find additional resources and explanations.

CDC Laboratory Training - Microbiology Series

(<https://www.cdc.gov/labtraining/training-courses/basic-microbiology/index.html>)

MIT Systems Microbiology

(<http://ocw.mit.edu/courses/biological-engineering/20-106j-systems-microbiology-fall-2006/>)

The Crash Course

(<https://www.youtube.com/playlist?list=PLVQ5cETbHzM0xnm4wQkNUw4-stqREf2GX>)

## Closed Captioning

Lecture videos and extra resource videos have automatic closed captioning. These captions are generated by computer algorithms. To utilize closed captioning, you can click on the CC button at the bottom of a video.

## Accommodating Disabilities

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Individuals requesting accommodation should submit a request in writing or in an alternative format appropriate for their limitations. The request should include documentation of the disability, including information with recommendations of appropriate accommodation. Once eligibility has been established, accommodations must be requested on a course-by-course basis.

Requests can be sent to the student services department at [help@gatewayeducation.com](mailto:help@gatewayeducation.com)