Biology 349 Microbiology Lab (Sec 02 and 03) Syllabus
Spring 2025

Section 02: Wednesday 9:30am – 12:20pm (ISC 302)
Section 03: Wednesday 1:30pm – 4:20pm (ISC 302)

Instructor: Dr. Matthew Hatkoff
Office: ISC 139A
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Office Hours
Thursday 10:00am-12:00pm
Friday 12:00pm-1:30pm
Or By Appointment (Face to Face or Virtual)

Course Description

An introduction to microorganisms, including Bacteria, Archaea, Eukaryotes, and Viruses. Topics include cell structure and function, cultivation, genetics, metabolism, ecology, evolution, and diversity of microbes. The role of microorganisms in human health and disease will also be examined. Laboratory activity complements lecture material. **PREREQUISITES: BIOL 222 or BIOL 271, minimum grade of D. It is assumed that you have the knowledge from these courses and their pre-requisites.**

Required Text

For the laboratory portion of the course there are no required materials. All laboratory materials will be available on Brightspace. Students are expected to print out lab materials before coming to class and to check Brightspace for materials. A three-ring binder is encouraged to organize these materials.

Grading

Your final grade in BIOL 349 a combination of your lecture and lab grade. Please see the table. Below is a breakdown of your lab grade.

Lab Grades	
Unknown Bacteria Presentation & Biochemical Requests	10%
Group Lab Report (Draft and Final)	7.5%
Short Reports (3 total)	5%
Lab Skills Assessment	7.5%

Assignment Descriptions

Short Reports

There will be three submissions expected from various labs throughout the semester. These submissions, or short reports, will take on various forms depending on the lab protocol that is followed. More information on these short reports will be covered throughout the semester.

Group Lab Report

As a lab group there you will write a formal lab report on one of the labs during the semester. Both a rough and final draft will be required to be submitted, and this should be properly cited, formatted, and follow standard conventions of lab reports.

Unknown Bacteria Presentation and Biochemical Requests

During the lab portion of the course, you will collect, grow, stain, and identify an environmentally sampled unknown bacteria using various metabolic tests. You will then use Bergey's Manual to determine the identity of this bacteria. You will also be given an "unknown patient sample" to identify as well. In order to properly ID these bacteria, you will need to determine the required biochemical tests using the materials given to you by your instructor. These biochemical tests will then be inoculated and read to determine the genus and species of both bacteria. We will then take a lab period in which you will present the identity of your environmental unknown using Powerpoint/Google slides. This presentation will include the logic and tests used to determine the identity of the bacteria, as well as background and important information on your unknown.

Lab Skills Assessment

During Weeks 10-14 a Lab Skills Assessment will be conducted by your instructor. You do not need to turn anything in for this assignment, however you will be observed on various techniques that have been reinforced during the beginning of the semester. This will allow your instructor to assess the skills you have been building through the semester to ensure a sound understanding of Microbiological techniques. The various skills and information will not be disclosed beforehand, but any portion of the laboratory or activities are able to be assessed. During Finals week students will be able to review their Lab Skills Assessment rubric if any questions arise during this process.

* For a full set of Course and College policies please refer to the Lecture Syllabus for this course*

Tentative Lab Schedule (subject to change at instructor's discretion)

It is expected that you check Brightspace at the beginning of each week for all lab materials and instructions and for any assignments that may be submitted through the LMS. You should print out and review each weekly protocol before every lab

Week Date	Subject	***Assignments*** Due on Friday of Indicated Week
1 Jan 22/23	1.1 Check In & Intro 1.2 Aseptic Technique & Transferring Cultures 1.3 Making Media 1.4 Effectiveness of Handwashing	N/A
2 Jan 29/30	2.1 Streaking Bacteria 2.2 Serial Dilutions 2.3 Introduction to Microscopy 2.4 Simple Staining	N/A
3 Feb 5/6	3.1 Gram Staining 3.2 Acid-Fast and Endospore Staining	N/A
4 Feb 12/13	4.1 Bacterial Growth Curve 4.2 PCR	***Short Report 1 Due: Serial Dilution Series (Exp 2.2 and 3.1)***
5 Feb 19/20	5.1 Gel Electrophoresis 5.2 BLAST Lab 5.3 Epidemiology Lab	N/A
6 Feb 26/27	6.1 Kirby Bauer & Chemical Inhibition Tests 6.2 Ames Testing 6.3 Physical Methods of Control (UV and Heat)	***Short Report 2 Due: BLAST Lab (Exp 5.2)***
7 Mar 5/6	7. 1 Collect Environmental Sample 7.2 Biofilm Formation (I) 7.3 Quantifying Microbial Contamination in Water	N/A
8 Mar12/13	8.1 4-way Streak of Unknown 8.2 Fermentation Experiment 8.3 Biofilm (II)	***Short Report 3 Due: Kirby Bauer and Chemical Inhibition (Exp 6.1)***
9 Mar19/20	**NO LAB- Spring Break**	N/A
10 Mar26/27	10.1 Gram Stain of Environmental Unknown and Patient Sample 10. 2 Introduction to Biochemical Tests & Catalase Test	***Biochemical Request List Due BY SUNDAY (Exp 10.2 for Exp 11.1)***

11 Apr 2/3	11. 1 Inoculation of Biochemical Tests to ID Environmental Unknown and Patient Sample	N/A
12 Apr 9/10	12.1 Read Biochemical Tests and Identify Environmental Unknown and Patient Sample	***Rough Draft of Bacterial Growth Curve Report Due (Exp 4.1)***
13 Apr 16/17	13.1 Finish any remaining lab work 13.2 Work on Presentation of Unknown 13.3 Work on Group Lab Report	N/A
14 Apr 23/24	**NO LAB- GREAT Day**	N/A
15 Apr 30/May 1	**Presentation on Unknown Bacteria**	***Final Draft of Bacterial Growth Curve Report Due***