Biology 349 Microbiology Lecture & Lab Syllabus
Spring 2025

Lecture: Tuesday/Thursday 8:00am-9:15am (ISC 131)
Section 02: Wednesday 9:30am – 12:20pm (ISC 302)
Section 03: Wednesday 1:30pm – 4:20pm (ISC 302)
Section 04: Thursday 2:00pm-4:50pm (ISC 302-Dr. Hutchison)

Instructor: Dr. Matthew Hatkoff
Office: ISC 139A
Email: mhatkoff@geneseo.edu

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

Brock Biology of Microorganisms By Madigan, Michael T. et al.
Pearson. 16th Edition
ISBN 10: 0134874404
ISBN 13: 9780134874401
If you are using an older or international edition, please note that you are responsible for the material in the required version of the textbook and associated pages/sections may not correspond

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.

Calculator

You will need a simple calculator (with basic functions and logs) in order to complete some assignments for this course.

Grading

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

Lecture Grades	
Exams (2)	35%
Group Pathogen Project	15%
Weekly Quizzes (8)	10%
Homework (varies)	5%
Participation (varies)	5%
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%

Any grade disputes by initiated within one week from when the assignment was returned.

The following scale will be used to calculate final grades. Students point totals or grading scheme may be adjusted to reflect course difficulty or section differences at the instructor's discretion.

	B+ 87.0% - 89.9%	**C+** 77.0% - 79.9%		
A 93.0% - 100%	**B** 83.0% - 86.9%	**C** 73.0% - 76.9%	**D** 60.0% - 69.9%	**E** <60%
A- 90.0% - 92.9%	**B-** 80.0% - 82.9%	**C-** 70.0% - 72.9%		

Standard rounding procedures will apply. For example, an 82.94 would be rounded to a B-, and an 82.95 would be rounded to a B.

Unexcused absences from lab will result in a 5% deduction from your lab grade. If you have more than 2 unexcused absences you will get a zero (0) from the lab section of the course.

Late Assignments

Late assignments will have a 10% grade reduction per day, and will not be accepted more than 2 days late.

Digital Communication

The best way to reach me is via email. What can expect from me regarding digital communication? I will respond to messages within 24-36 hours, M-F unless otherwise announced. However, emails and messages sent after 5pm may not be answered until the next day. Emails sent late Friday or over the weekend may not be answered until the following Monday. Please know that I do not expect that you will read or respond to my messages outside of normal business hours should I send one during those times.

Learning Outcomes for Microbiology

After completing the BIOL 349 course, successful students will be able to:

(1) List and describe major microbial cell structures, growth rate parameters, and metabolic pathways.

(2) Apply basic concepts of microbial cell structure, growth, and metabolism to understanding pathogenic and symbiotic interactions.

(3) Explain similarities and differences between Bacteria, Archaea, and Eukaryotes, and understand how these concepts relate to the evolutionary history of these three domains.

(4) Isolate bacterial cultures using aseptic technique, and assess microbial phenotypes, growth parameters, and metabolic capabilities in the laboratory.

(5) Describe and demonstrate methods for assessing microbial diversity and setting up enrichment cultures.

(6) Understand and analyze primary literature in the microbiology field, and communicate data on microbial experiments through posters and lab reports.

Assignment Descriptions

Exams

There will be two exams, a midterm administered during the indicated class period, and a final during Finals week. These exams will consist of a variety of types of questions (multiple choice and short answer) covering the previous Unit. This will include all the information from lecture and the assigned readings (textbook, articles, etc.) which may or may not be covered in class.

Make up exams are not administered without prior approval to missing the exam. Safety is a priority, and please do not attend class or an exam if you have tested positive for COVID or other infectious respiratory illnesses. It is your responsibility to be in contact with me for (1) approval to miss the exam and (2) scheduling a make-up exam.

Please note the exam dates for this course. If you have a legitimate scheduling conflict you must notify me within the first 2 weeks of class. Otherwise, you will have to take exams as scheduled in the syllabus. If you are ill or have another unexpected issue, come up, you must have approval for a make-up exam before missing it, otherwise you cannot make-up the exam.

Group Pathogen Project

Groups of three to four students are to research, discuss and write a report on a bacterium as selected from the given list. The topics will be drawn from lists of causative agents that have been designated as (re)-emerging diseases or healthcare-associated infections (HAIs) as compiled by the Centers of Disease Control and Prevention. These reports are expected to be formal in nature, with at least 10-15 primary or review literature citations and will include information such as epidemiology, metabolic characteristics, virulence factors, transmission, treatments, history, and other relevant information. This project will have checkpoints during the semester to ensure groups are on track and will require written records of meetings to ensure equitable distribution of work for all group members.

Weekly Quizzes

Quizzes will occur on Thursdays (of most weeks) and will cover the material from the previous classes. Quizzes are designed to help you keep up with the lecture and reading material for the course and assess your knowledge of the material on a weekly basis. We will have 8 quizzes, and I will drop your lowest quiz grade. Since I drop the lowest quiz grade, I will not administer make-up quizzes except for extenuating circumstances or for university approved absences.

Homework

Through the semester there will be several homework assignments completed through Brightspace. These will focus on a few topics and will be designed to reinforce key principles, allow for some creativity. At times you will be encouraged to work with students from lecture or lab, but all work should be uniquely yours.

Participation

I will intersperse lecture with practice problems and questions, or group discussions/problems, and part of your grade is determined by participation in class. I will randomly call on individuals to answer a question or contribute a thought, and you earn points by participating. I will also have groups work on a problem and turn in their answer at the end of class. You are not penalized for incorrect answers or for asking for help from other students. These activities are meant to stimulate intriguing conversations and explore topics that may not have "right" or "wrong" answers.

Lab Assignments

Please see the syllabus for your specific lab section for details regarding the lab schedule and assignments. Students will be graded based on the same sets of assignments in all lab sections, though some diversity within the lab and experiments may exist. For any questions regarding the lab please contact your lab instructor directly.

Tips for Success

Laboratory activities will be posted on Brightspace and you are required to read over them before coming to lab.

One of the components of success in the lab is keeping a good lab notebook. Since lab materials are posted on and printed from Brightspace, you can keep your materials in a binder, and add in pages for any notes that you have. I will allow you to use your notebook for the lab practical, so it will greatly benefit you to keep an organized notebook.

To be a good microbiologist, there are some basic skills (aseptic technique, media making, plate streaking, microscopy, etc) that you need to learn, and these skills will be necessary in almost any microbiology or molecular biology lab. You'll have two opportunities to demonstrate your mastery of these skills during the final 4 weeks of lab. These skills will be assessed by your instructor through the Lab Skills Assessment. If we have any down time in the lab, use this time to practice skills, or you can schedule some extra time outside of lab (for example during office hours) to practice.

Be sure to keep up with the lectures, practice problems, and quizzes, and attend office hours as often as you can; don't procrastinate - if you're struggling or don't understand something, get help from me during class or office hours as soon as possible. There are many resources available if you need help.

My suggestion is to read over the assigned reading before class. This will help familiarize you with the topics that will be covered, and if any topics are completely unfamiliar to you then you can do a more in-depth reading of that section. After lecture, take a more careful look at the assigned readings, using what we covered in class to focus your reading, and to prepare yourself for the quiz on Thursday.

Asking for help

My goal for the course is for you to learn about microbiology. My job is to create learning materials and assessments that promote learning, and provide you with clear guidelines on how to succeed. My job is also to answer your questions and help to foster your scientific curiosity. I'm here to help, and in fact chatting with students and answering their questions is one of the best parts of my job! So, please don't hesitate to reach out if you have questions about the course material, or other general student questions. Asking for help is a sign of self-awareness and strength.

Student Accommodations and Accessibility

SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility will coordinate reasonable accommodations for persons with physical, emotional, or cognitive disabilities to ensure equal access to academic programs, activities, and services at Geneseo. Students with letters of accommodation should submit a letter to each faculty member and discuss their needs at the beginning of each semester. Please contact the Office of Accessibility Services for questions related to access and accommodations.
Office of Accessibility Services
Erwin Hall 22
(585) 245-5112 access@geneseo.edu; (mailto:access@geneseo.edu;)
www.geneseo.edu/accessibility-office

Use of AI and writing assignments

Technology changes almost as rapidly as microbes mutate! This is not a bad thing, but it's important to be aware of how it can impact learning, and there are significant potential academic dishonesty issues that can arise. Most of you are likely aware of the wildly popular AI program chatGPT. It's fascinating! However, I strongly recommend not using it for your coursework for several reasons: (1) if you don't complete assignments yourself, you are not learning. If you're not going to do the work, honestly it's a waste of your time to take this course; (2) chatGPT is not an expert in microbiology, and will likely be prone to errors in writing assignments. If you do use chatGPT to generate any text you must cite the program in your references or works cited section. Assignments containing text written by chatGPT will not receive full credit compared to assignments that contain original work. Using AI-written work without citing it constitutes an academic dishonesty violation (see section below). Finally,

please note that there are programs (e.g. GPTZero, created by student Edward Tian (https://www.npr.org/2023/01/09/1147549845/gptzero-ai-chatgpt edward-tian-plagiarism) that can detect AI-written work.

Academic Dishonesty & Plagiarism

Students are expected to adhere to the University's policy on academic dishonesty and plagiarism, located in the student handbook. Academic dishonesty and plagiarism have serious consequences, and if you're struggling in class, please ask for help rather than resort to academic dishonesty! Academic dishonesty will result in a zero on the assignment or exam. In addition, a report will be filed to the department chair and Dean of the College, and a record of academic dishonesty will be placed in the student's file at the Dean of Students Office.

Guidelines for Attendance and Public Health

As we continue to deal with variants of the COVID-19 virus and other respiratory infectious diseases, well into the future, I share these expectations for classroom attendance and protecting public health. SUNY Geneseo is a residential liberal arts college where we all learn together in a shared space. This classroom community is vital for engaging in discussions, solving problems, and answering questions together. Learning is an active process, and it requires engagement - on my part and yours. I promise to create an interactive and collaborative classroom space, and in return I expect you to attend and engage in the activities.

Because we want you to be successful and because we value your contribution to the course, we expect you to prioritize attendance. If you are experiencing symptoms associated with COVID or other respiratory infectious diseases on a day we have class, please take a COVID test. Testing is available through the Health Center, or you may take a self-test if you have one. If you test negative and feel well enough to attend (no fever without fever-reducing medication), put on a well-fitting mask, come to class, and maintain physical distance as much as possible. If your symptoms do not allow you to attend class, stay home (except to go to the health center), rest, and take care of yourself. I expect you to communicate with me directly about your absences. I can support you to keep up with class if you are out for illness-related reasons, but I need you to take responsibility for being transparent and clear in letting me know when you are out and why. Although I can work with you on keeping up, you may miss some course content and extended absences may impact your ability to realize your full potential in this class. For extended absences (i.e., more than a couple of days of classes), you should contact the Dean of Students who can assist with reaching out to your faculty.

Policies Governing Religious Observances

Under state law (Education Law, Section 224-a) students should be excused from course requirements, such as examinations, class attendance, or other academic study and work requirements, for religious observance. Students must be permitted to make up missed work without penalty. It is the student's responsibility to notify the College about any religious practices that may interfere with their attendance. See the full policy and links to holidays.

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

It is expected that you check Brightspace at the beginning of each week for extra lecture materials and instructions and for any assignments that may be submitted through the LMS.

Date	Subject **(Assignments)**	Reading
Jan 21	Introduction	
Jan 23	History of Microbiology; *Mycobacterium tuberculosis*	Ch. 1; Ch. 31.4
Jan 28	Microbial Size, Shape, and Diversity; *Plasmodium*	Ch. 1; Ch. 34.5
Jan 30	Microbial Cell Wall and Membrane; *Borrelia burgdorferi* **(Quiz 1)**	Ch. 2.1-2.5; Ch. 32.4
Feb 4	Cell Surface Structures and Motility; *Vibrio cholerae*	Ch. 2.6-2.12; Ch. 33.3
Feb 6	Microbial Metabolism I; Diphtheria and Pertussis **(Quiz 2)**	Ch. 3.1-3.6; Ch. 31.3
Feb 11	Microbial Metabolism II **(Homework #1)**	Ch. 3.7-3.10
Feb 13	Microbial Growth I; *Streptococcus ssp.* **(Quiz 3)**	Ch. 4.2-4.9; 4.11-4.13, 4.16; Ch. 31.2
Feb 18	Microbial Growth II; Mycoses	Ch. 8.1-8.3, 8.5; Ch. 34.2
Feb 20	Genetic Regulation I; Influenza	Ch 7.1-7.7; Ch. 31.8
Feb 25	**No Lecture- Diversity Summit**	
Feb 27	Genetic Regulation II; Tetanus, Botulism, & Gangrene **(Quiz 4)**	Ch. 7.8-7.16; Ch. 32.9
Mar 4	Genetic Regulation III; Various causes of food poising	Ch 9.1-9.8;
Mar 6	Eukaryotes; Leishmaniasis, Trypanosomiasis, & Chagas	Ch. 18.1-18.5; 18.9-18.10; Ch. 34.6
Mar 11	Viruses I; Ebola	Ch 5; Ch. 31.12
Mar 13	**MIDTERM EXAM**	Intro through Eukaryote
Mar 18	**NO LECTURE- SPRING BREAK**	
Mar 20	**NO LECTURE- SPRING BREAK**	
Mar 25	Viruses II; MMR and Chickenpox	Ch 11.1-11.7; Ch. 31.6
Mar 27	Viruses III; Yellow & Dengue Fevers, Chikungunya, and Zika **(Quiz 5)**	Ch 11.8-11.13; Ch. 32.5
Apr 1	Host-Pathogen Interactions I; *E. coli*	Ch. 25.1-25.4; Ch. 33.11
Apr 3	Host-Pathogen Interactions II; Nipah Virus	Ch. 25.5-25.8
Apr 8	Bacterial Secretion Systems; *Yersinia pestis* **(Homework #2)**	Ch. 6.11-6.13; Ch 32.7; Paper
Apr 10	Synthetic Biology **(Quiz 6)**	Ch. 12.1-12.2; 12.6-12.10; Paper
Apr 15	Antibiotic and Antibiotic Resistance; *S. aureus*	Ch. 28.5-28.7; Ch. 31.9
Apr 17	Innate Immune Response; HIV **(Quiz 7)**	Ch. 26.1-26.4; Ch. 31.15
Apr 22	Innate Immune Response; Hepatitis **(Homework #3)**	Ch. 26.5-26.10; Ch. 31.11
Apr 24	Adaptive Immune Response; Rabies **(Quiz 8)**	Ch. 27.1-27.4; Ch. 32.1
Apr 29	Adaptive Immune Response; HMPV	Ch. 27.5-27.8
May 1	Epidemiology; M-pox	Ch. 30.1-30.4
May 6	Epidemiology/Vaccines **(Group Pathogen Report Due)**	Ch 30.5- 30.9
May 15	**FINAL EXAM 8:00-10:30am**	**EXAM**