

BIOSC 1860: MICROBIOLOGY LABORATORY
Department of Biological Sciences University of Pittsburgh

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Office Hours	Office hours will be conducted via Zoom and need to be requested via email to arrange a meeting time.
Meeting Times	<p>There are 3 lab sections, all meet in G5 Clapp Hall:</p> <ul style="list-style-type: none">• Mo & We: 9:00 - 11:50 am – Stefanie Hedayati• Tu & Thu: 8:30 – 11:20 am – Young Ahn• Tu & Th: 12:00 – 2:50 pm – Stefanie Hedayati• Lecture, 404 Information Sciences Building: Fri: 10:00 - 10:50 am (via Zoom from 8/27 – 9/10; subject to change) You have to be registered for one lab section and the lecture. Notice that the lecture is NOT in the complex of Biological Sciences.• Attendance is mandatory in both labs and lectures! There is no online option for the laboratory; online lectures will be held synchronously. Asynchronous participation in this class is not possible. Lab classes will not be recorded; online lectures may be recorded and made available only to students in the class.• How to access G5 Clapp: Enter via the Clapp Lobby, tap your ID card – you will NOT be allowed in the building should you not comply with University Covid protocols, i.e., weekly testing unless vaccinated and wearing a mask that covers both nose and mouth. After that, proceed to the left, go down the stairs, through the doors and then turn left to find G5.• How to access 404 Inf Sci Building: Information to follow
Course Objectives	<p>In this course you will (i) learn basic techniques and methods used in studying microorganisms, (ii) practice the process of scientific method by conducting research in the field of microbiology and (iii) learn how to collaboratively work on a project between the research group members.</p> <p>During the semester you will:</p> <ul style="list-style-type: none"><input type="checkbox"/> master techniques and methods commonly applied to study of microbes<input type="checkbox"/> conduct your own research project pertaining to the isolated microbes; revise approaches; provide critical evaluations to your classmate's projects

- formulate and investigate hypotheses
- collect scientific data
- analyze data and make scientific conclusions
- keep a detailed record of your experimental procedures, data and conclusions in an electronic lab notebook

Communication is an essential skill in any working environment, and you will have numerous opportunities to build this skill by taking part in group discussions of the experiments, orally report on your research progress, and share results and conclusions of your research project with your peers and other members of the department during the poster presentation at the conclusion of the term.

In addition to the two laboratory sessions per week, this course also includes a one-hour lecture session. The lecture will be initially conducted online – we may transition to in-person learning according to university guidelines. The lecture will be used for some or all of the following: special instruction, group discussions and weekly “catch-up”, review of procedures, oral presentations, preparation for the special projects, and presentations of research progress.

The Experiments: most of the time, you will be conducting two or more experiments at once. This is standard practice in microbiology, because what we do mostly is inoculate cultures for some test or experiment, then wait for them to grow up for use or results interpretation. To use our time efficiently, we must do more than one thing at a time, so we aren't just twiddling our thumbs while things grow. The coursework is loosely grouped into the following sections:

- Cultivation-dependent community analysis
- Selective enrichment for specific groups of microorganisms
- Morphological and phenotypic characterization of bacterial isolates
- Bioinformatics analysis of 16S rRNA genes
- Molecular evolution: phylogenetic analysis
- Independent research, poster preparation & presentation

Course Material

There is no required textbook or lab manual for this course. Any material you need to perform the experiments and operate laboratory equipment will be supplied to you as needed. There will be handouts in class, and documents uploaded to Canvas, LabArchives.

The basic lab manual we will use for microbiology procedures in the first weeks of the course is: Godfrey, S., *A microcosm under a cabbage: a supplemental manual for introductory experimental microbiology, 2000.*

The protocols from this manual are posted on Canvas under the modules corresponding to each lab day.

In addition to the documents supplied to you on Canvas, the textbook that is required in Biosc1850 (pre or co-requisite to the lab course), or any other comparable Microbiology textbook, should be used to supplement the theory, and for any background review. Together these materials provide background material and protocols adapted from the technical literature in microbiology, some from other published sources, and some developed specifically for your experiments.

It is necessary for you to realize that in using these sources you may not perform an experiment exactly as it appears in your texts. Rather you will use these sources as you would a cookbook: the source provides a recipe that you adapt to your own needs. We may want to use a technique described in the manuals for *E. coli* in an experiment we are doing with a different type of bacteria.

If you are considering a career in laboratory biology, it is essential for you to become comfortable with this approach to experimental protocols. The lack of published procedures that are specifically designed for your own needs is a situation you will encounter frequently as you pursue your careers. Learning to use protocols thoughtfully and imaginatively is part of your preparation for such careers, and class sessions will focus on this skill.

The additional technology is essential for successful participation in this class:

- Reliable internet connection
- An electronic device capable of accessing the internet and equipped with a camera and microphone (it is strongly recommended that you have a device such as a laptop or tablet and not just a smart phone). Essentially you need to be able to videochat via Zoom with your classmates and instructors if necessary.
- The ability to access any website under the pitt.edu domain and LabArchives.

Covid-19 safety

We are still in a pandemic and we strongly urge you to follow recommended safety measures to protect yourselves, your classmates, friends and family. For the most up-to-date information and guidance, please visit **coronavirus.pitt.edu** and check your Pitt email for updates before each class. Also see the separately provided handout for more information.

To ensure the safety of students and instructors during the lab course, and providing you with a high-quality learning experience, the following policies will be implemented and followed without exception:

- You will have to wear a face mask AT ALL TIMES. There will be no exception to this. If you are not able to wear a face mask, you will not be permitted in the lab.
- Be flexible: it is possible that we will have to transition to 100% online or a hybrid learning setting at any point during the semester. It is possible that you and/or your instructors get sick/have to quarantine. Your instructors

	<p>will do their best to ensure your learning will continue during these extenuating circumstances.</p>
Course Tools	<p>Canvas, http://canvas.pitt.edu, will be used to post notes on experimental protocols, how to use laboratory instrumentation, course and class announcements, and other additional material. During your independent research projects, you will collaborate with members of your research team. To facilitate communication and file sharing with each member of your research group and the instructors, you will regularly upload your files (notes, images, results, reports) into Canvas. If you need help contact computer help desk at 412-624-HELP. You are expected to check Canvas daily. You may also find supplemental videos of experimental procedures on Canvas.</p> <p>In addition, we will use LabArchives as an electronic notebook. You will also find experimental protocols and instructions for equipment use in this interface. LabArchives allows collaboration on entries, and keeps a time stamp for each entry (including the username). Each person will keep their own lab notebook! There will be no group lab notebooks.</p> <p>Again: it is your responsibility to frequently check for announcements and uploads to these interfaces!</p> <p>We will use Zoom to facilitate remote office hours.</p> <p>Gradescope may be used at times for various written assignments (math quiz, written exam).</p> <p>Everything with the exception of LabArchives can be accessed via the class Canvas interface. To access LabArchives, you have to go to the main my.pitt.edu website.</p> <p>Please note that Canvas is not supported equally by different web browsers. In my experience, Google Chrome works better than Safari but you may need to test the accessibility of Canvas (especially in conjunction with Panopto) using a variety of browsers.</p>
Student Evaluation and Grading	<p>Good laboratory work develops as a combination of many different skills. If you are better at the lab bench than at the examination desk, we want your grade to give you credit for that. Consequently, our evaluation of your coursework will proceed at several levels.</p> <p><i>Preparation for class:</i> It is crucial that you are coming to the laboratory having read the day's protocol(s) and pay attention to the beginning of the lab where techniques, protocols and procedures are introduced. Lack of preparation may result in difficulty performing the day's experiments correctly. Point deductions will occur for bad lab citizenship (i.e., not cleaning up your bench, not cleaning</p>

your microscope, not putting items back in the right place in the common drawer). You will start with 20 lab citizenship points and points will be deducted at the instructor's discretion after a one-time warning.

Practical Examinations: **there will be one lab practical examination, split over two lab days;** tentative dates are listed in the lab schedule and will be confirmed two weeks prior to the exam. The practical exam may cover serial dilutions, spread plating, staining, microscopy, PCR, and other techniques covered in class; as well as quantitative problems similar to the ones given in the Microcosm manual, used in class, and included on the diagnostic lab math quiz. Information on practical exam is posted on Canvas. The practical exam will be graded numerically. There may also be various small stakes assessments of laboratory skills during the semester.

Written Exam: **There will be one cumulative full-written exam towards the end of the semester.** The tentative date is listed in the lab schedule and will be confirmed two weeks prior to the exam. If, and only if, you provide documentation for an acceptable excuse for missing an exam, you may be allowed to take a make-up exam. Documentation must be presented within one week (5 business days) of the missed exam. All make-up exams will have a combination of written and oral components.

Lecture assignments: Throughout the term there will be weekly lecture assignments consisting of questions regarding assigned research articles, experiment interpretation and planning, poster and talk material. Many of them will be team assignments, but some will have to be completed individually and submitted using Canvas.

Final presentations: In consultation with the instructors, student groups will work together on a project related to samples given to the course by Dr. Kevin Kohl's lab. The **poster presentation** will be a compilation of the experiments, data, results, and conclusions from both the common class components as well as the different group projects. The poster presentation grade will also include the quality of your collaborative work, general laboratory competence and engagement. Posters will be presented at the end of the semester either in an online or an in-person poster session. Since you will not be able to visit/view every single poster, each group will also prepare a **short (~10 min) overview presentation** of their semester's project to be given to the whole class during lecture at the end of the semester. For this, you will most likely collaborate with at least another group that worked on a similar sample as you. Details will follow separately.

Lab Notebook: all students must keep an electronic lab notebook using the LabArchives platform to plan experiments, write procedures, and record notes and data. Your notebook will be evaluated across the course and will be retained after completing the course, since the data obtained in some projects

will be used by research labs on campus to inform further experiments and/or for publication purposes. Although you will be working in teams during this course, your lab notebook must be your own work, completed independently. All group members are required to record the experiments they perform during lab. Detailed instructions and a rubric can be found on Canvas and on LA.

Course Grade

Your course grade will be calculated as follows (note that the exact proportion may change during the semester):

Assessment	Grade proportion
Practical exam	15%
Lecture assignments	15%
Lab citizenship/preparation for class	10%
Lab Notebook	10%
Poster presentation	25%
Summary talk	10%
Written exam	15%

**Assignment
Regrading Policy**

You may request a re-grade of any portion of an assignment by submitting you request in writing and explaining why you think the grading was in error. You must include a detailed justification for the correctness of your answer, including references to the text used in the course (text, page, paragraph). This request must be submitted to the instructor within one week (5 business days) after the date the assignment is returned/grade is posted to Canvas. Unless the re-grade is due to an additional error, please be aware that your entire exam may be reevaluated and any question that was graded incorrectly (in your favor) may also be re-graded resulting in points deducted from your total. Re-grading requests raised beyond a week after an assignment has been returned/grade is posted will not be addressed.

G grading

If you wish to petition for a G grade, you must submit a request for this change in writing and you must document your reason(s). You will be required to make arrangements in person for the specific tasks you must complete in order to remove the G grade.

You will be expected to sign documentation describing the work that has to be completed and the due date. All required work must be completed by the specified date otherwise a zero will be assigned for the work and final grade will be determined using this score. Remember that G grades, according to CAS guidelines, are to be given only when students who have been attending a course and have been making regular progress are prevented by circumstances beyond their control from completing the course after it is too late to withdraw.

Absence Policy

If you aren't certain whether your reason for an absence will meet our guidelines, please ask. We try to be as accommodating as we can while still treating everyone fairly. Any need for an absence or request for extra time on an assignment must be documented. We are happy to accommodate requests for post-graduate interviews; please provide a copy of the interview invitation to your instructor.

If you miss an exam and are permitted to take a makeup exam, the makeup may not be of the same kind as the exam taken by the class. For example, the makeup exam it could be composed of essay questions instead of short answers or might be an oral exam.

If you must be absent from a laboratory session and wish to make up the lab work, you may be able to do so by arranging to attend some other section for that session if, and only if, you ask us about it during or before the previous week; and if there are other sections of the class offered. Otherwise, we may or may not be able to accommodate you. You will not be permitted to attend a different section's class meeting without arranging it with us in advance. There are classes meeting both morning and afternoon in the laboratory classroom, so scheduling make-up work is very difficult, and in some cases, impossible.

If you will be unable to attend any day that material is scheduled, we may or may not be able to arrange for you to make up the work, depending on what experiments are involved. Some class materials are unstable and complicated to prepare, and we may not be able to make them available at additional times.

Absences will not excuse you from responsibility for assignments, practical exam, or other examination coverage of missed work.

Since the introductory and background material for a class is presented at the beginning of the session, **missing the start of a class (20 minutes) counts as a minimum of missing one half of the class. If you arrive to class late, you will be allowed to participate in the day's experiments *only* at the discretion of the instructor.** If your late arrival results in either a safety concern or an undue burden to the instructors/prep staff/students, you will not be allowed to attend the class. In this case you will be responsible for scheduling a make-up session, if that can be accommodated. Missed work = missed credit, so please be considerate of your instructors and your classmates and be conscientious in your attendance.

- If you miss a class because of an emergency, we hope you will be able to let us know. Please send an email to your instructor or ask someone else to email us.
- Keep in mind that any unexcused absence is *unacceptable* and *impossible to overlook*. Any incomplete lab exercise will affect your grade. It is your responsibility to follow-up on missed work within a week of a missed class. If

you do not clear missed work within a week you will obtain a zero score for the missed work.

- Missing more than 4 lab periods (2 weeks of class) will result in a failing grade ('F') no matter how well you do on the examinations and assignments. **NOTE: there will be a separate policy outlined should you have to isolate due to Covid-19 or quarantine due to exposure**

- **Any absence must be properly excused by a healthcare provider OR Pitt Student Health for an illness or a University official for University business.** Excused absences are at the discretion of your instructor, although most absences may count as excused if you keep in regular communication with your instructor and demonstrate a reasonable effort to make progress in the course. Acceptable documentation should be submitted to your instructor via email within one week of the missed class or it will not be accepted. The penalties for unexcused absences are as follows:

1 unexcused absence	No additional penalty
2 unexcused absences	Deduction of ½ letter grade from final grade
3-4 unexcused absences	Deduction of one full letter grade from final grade
> 5 unexcused absences	Failure for class (if withdrawal option or G grade not taken)

- Please note: Students are required to comply with University safety protocols in order to access University buildings, i.e., weekly Covid-19 testing unless fully vaccinated, and wearing a face mask that covers both nose and mouth. If you are not complying with these protocols, and are therefore denied access to Clapp and the Clapp classrooms, your absence will count as an unexcused absence.
- As a reminder, lab classes are not being recorded.

Late Add Policy

Because experimentation and other class activities start on the first day of class, adding the course during the Add/Drop period will result in you missing important course work, including work vital to the course research project. Please be aware that you are responsible for catching up and completing any missed work. The deadlines for any project-associated work and submissions cannot be extended. Some work may not be possible for you to make up.

Late Assignments

Lecture assignments are due as designated in the lecture schedule; lab notebook checks are due as in the schedule/announced via a Canvas assignment; practical exam and written exams will not be accepted late. Assignments are considered late if they are turned in after this designated due date time. Late assignment submission penalties for lecture assignments and lab notebook entries only are as follows:

	<ul style="list-style-type: none"> • Submitted within 24 hours of due date/time: 10% • Submitted within 48 hours of due date/time: 20% • Submitted after 48 hours of due date/time: no credit <p>Oral presentations, poster presentations, and other team assignments also cannot be submitted late. Assignments that cannot be submitted late will be designated as such on Canvas. Additionally, assignments that have been graded and returned to the class will not be accepted late.</p>
<p>Academic Integrity</p>	<p>Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity and the Dietrich School of Arts and Sciences Academic Integrity guidelines. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.</p> <p>Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.</p> <p>Please note that academic integrity goes in both directions. Just as we expect you to act in an honest and honorable manner when attending this class, we will treat all students fairly and respectfully. We will not favor any student nor discriminate against any student. View the complete policy at: www.cfo.pitt.edu/policies/policy/02/02-03-02.html.</p>
<p>TurnItIn</p>	<p>By taking this course, students agree that all required assignments may be subject to submission to TurnItIn.com for plagiarism checking. All submitted papers will be included as source documents in the TurnItIn.com reference database solely for the purpose of detecting plagiarism of such assignments. Use of TurnItIn.com is subject to the Usage Policy and Privacy Pledge posted on the TurnItIn.com site.</p>
<p>Student Conduct</p>	<p>In keeping with the University of Pittsburgh Student Code of Conduct, all students are expected to behave as respectful and civil members of the university community. All instructors and students will act in a considerate manner in order to create and maintain a classroom atmosphere that is conducive to learning. In addition to being unacceptable on the grounds of common decency, disruptive and disrespectful behavior contributes to unsafe working conditions.</p>

	<p><i>Disruptive and disrespectful behavior will not be tolerated!</i></p> <p>Examples of disruptive behavior include, but are not limited to, repeated tardiness, texting in class, speaking or acting in any sexually, racially, or ethnically harassing manner, cheating, misuse and abuse of laboratory equipment and material, disregarding any safety guidelines.</p> <p>Disruptive students will be referred to the Office of Student Conduct for mediation, discipline, or both.</p>
<p>Email Communication Policy</p>	<p>Each student is issued a University e-mail address (<i>username@pitt.edu</i>) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to http://accounts.pitt.edu, log into your account, click on Edit Forwarding Addresses, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to www.bc.pitt.edu/policies/policy/09/09-10-01.html.)</p>
<p>Disability Services</p>	<p>If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-624-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course. For more information, visit www.studentaffairs.pitt.edu/drsabout.</p>
<p>Copyright Notice</p>	<p>These materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See Library of Congress Copyright Office and the University Copyright Policy.</p>
<p>Accessibility</p>	<p>Canvas is ADA Compliant and has fully implemented the final accessibility standards for electronic and information technology covered by Section 508 of the Rehabilitation Act Amendments of 1998. Please note that, due to the flexibility provided in this product, it is possible for some material to inadvertently fall outside of these guidelines.</p>

NOTE: Class meetings on Zoom (including video, audio, and chat text) may be recorded and made accessible to all students enrolled in this course section. Violations are subject to the University of Pittsburgh Student Code of Conduct.

General Operating Policies

- **Please sign in to Zoom using your Pitt Zoom account. Please also use your full first name and last name as listed on the class roster. You will be entered into the course waiting room and will be individually admitted into the meeting by your section instructor to ensure the security of the course meeting.** Your instructor relies on recognizing student names to take attendance and to form student groups in Breakout rooms. If you prefer to use a nickname or other preferred name, please inform your instructor on the first day of class. If you have changed your name to better reflect your gender identity, please send a private message (Canvas or email) to your section instructor so that they can update the course roster with your preferred name. You can change your preferred name within the Pitt system by [following these instructions](#). If your instructor is unable to match your Zoom display name with the official course roster, you will not be admitted into the Zoom meeting.
- If you do not have access to a computer or smartphone with internet access, you can participate in the Zoom meeting by calling with a landline telephone. This is not optimal, but it will allow you to participate in the meeting via audio. Please contact your instructor if you are having difficulty in obtaining an internet-enabled device with access to the internet to use for class.
- **Stay focused.** It is very tempting to multitask during an online class, but [multitasking has been shown to increase the time students need to study for a course as well as lowering students' grades](#). Additionally, use of other apps on your device that are not relevant to class will reduce your available bandwidth, resulting in poor quality Zoom connections and frequent disconnections to Zoom. We recommend only running apps that are currently being used in the course while you are participating on Zoom.
- **Find a comfortable environment for class.** [Review some good practices for staying organized in online classes and setting up an ideal home workspace](#). Feel free to keep snacks/drinks readily available in your work area. Take a quick stretch break when needed.
- **Do not share Zoom links with any person NOT registered for this course.** We respect students' rights to privacy and to a safe classroom environment free of outside disruption. Unauthorized participants will be immediately removed from the meeting and violations will be reported to Student Affairs.

- If you need technical help, you can contact the [Pitt IT Help Desk](#) by calling 412-624-4357, emailing helpdesk@pitt.edu, [submit a help request online](#), or chat live with a Help Desk technician. Help Desk technicians are available 24 hours per day, 7 days per week.

Video

- **Turn on your video when possible.** It is helpful to be able to see each other, just as in an in-person class.
- In cases of limited internet bandwidth or no availability to a webcam, we recommend an audio-only connection.
- Using a [virtual Zoom background](#) can be very helpful if you cannot find an environment without a lot of visual distractions or if you aren't comfortable sharing your background. Get creative, but please keep your background choice professional and respectful to others.
- **Keep it clean!** Don't share anything that you wouldn't put up on the projector in class.

Audio

- **Mute your microphone when you are not talking.** This helps to eliminate background noise.
- **Use a headset if possible.** If you have access to headphones with a microphone, please use them. This will improve audio quality and is particularly important when you Zoom with your remote lab group partners during lab time.
- **Work in a quiet place if possible.** Turn off any music, videos, etc. in the background.

Screensharing

- **You will be asked to share your screen with other students/teammates/instructors throughout the course.** When screensharing, please remember to keep it clean-don't share anything that you wouldn't put up on the projector in class.

Chat

- **Stay on topic.** Please use the chat window for questions and comments that are relevant to the class; the chat window is not an appropriate place for socializing or posting distracting comments. The chat window should be kept free of off-topic information to allow others to quickly sort through information needed to address questions/comments about course material.

- **Disrespectful comments and hate speech will not be tolerated in the chat.** Just as in the physical classroom, respectful behavior is expected from all class participants. In order to protect the safety of all students in the course, any student making disrespectful comments or hate speech in the Zoom meeting or in the Chat will be removed from the Zoom meeting for the day and will not be permitted to rejoin the course until meeting with the course instructor to review appropriate behavior standards. Repeated violations will be reported to Student Affairs.
- **Chat transcripts will be archived and made available for review by all students in the course.** Private chats are disabled for this course (Zoom does record all private chat transcripts and makes them available to the meeting host – keep that in mind in general), so please use the main chat room or Breakout chat room to post all of your questions and comments.