

BIOL 4406-Bacteriology-4 credits
Texas A&M University-San Antonio
Department of Natural Sciences
Spring 2024 Syllabus

Instructor: Dr. Davida Smyth

Office: STEM 311E

Phone: 210-784-2475

Office hours (student help time/one-on-one time): T/TR 12-1 pm

Email: dsmyth@tamusa.edu

Class Meeting Times and Location(s)

Lecture: TR 2.00-3:15 pm

Lab: R. 3:30 pm to 5:45 pm CAB 334

By participating in this course students will

- demonstrate their knowledge of the structure, growth, and metabolism of bacterial cells; the structure, replication, and regulation of bacterial genes; and current microbiology applications through quizzes, projects, and case-study assignments.
- apply their knowledge by participating in an authentic research experience, gain hands-on experience with experimental methods and design, metadata curation, next-generation sequencing, and analysis and interpretation of sequencing results.
- effectively work together to design experiments, analyze data, critique and peer mentor one another, and learn the value of different ways of thinking and knowing.

As a writing intensive course, students will

- develop their scientific writing skills in the laboratory by completing weekly Benchling entries and completing peer-review assignments of each other's work.
- create engaging and scholarly posters of their research activities during the laboratory sessions. They will also present their posters in an online poster session using recorded videos.
- generate an ePortfolio that highlights the characteristics of a chosen microbe that is accessible and engaging.
- learn how to critique information, interpret data and results, and ask the right questions.

Catalog Description

This course studies the diversity of the bacterial world, including the array of metabolic pathways used by different species of bacteria to inhabit a wide range of environments. Emphasis will be on mechanisms of controlling gene expression in prokaryotes, biochemical pathways of energy production and consumption, culture techniques and diagnostic methods, and the use of bacteria in research. With laboratory section. Prerequisite(s): BIOL 2411, 2421, CHEM 1312/1112. Recommended: CHEM 2323.

Expectations

Significant study time outside of class is expected. The rule of thumb for any course is to spend 3 hrs. per week outside of class for every hour in class. Thus, for lectures alone, you should spend a minimum of 9 hours per week studying outside of class hours (>1 hr. per day). This could be reviewing your notes and PowerPoints, re-reading the textbook, answering questions within or at the end of chapters, or even looking up relevant outside materials online to reinforce class concepts.

Textbook for Lectures

1. *Prescott's Microbiology* (11th ed.) Willey, et. al. You will have an e-book link on Blackboard once you purchase the required Connect Access. You may order a loose-leaf paper copy through the Connect system for about \$25-30. (There is a button on the upper left of your student home page in Connect.)

Other Required Materials

- Blackboard access: Students are expected to access Blackboard daily.
 - Announcements will be posted on Blackboard and are considered equivalent to items announced in class. Download the app so I can always connect with you.
 - The calendar on Blackboard will help you keep updated on what's to be done and what assignments are due when. Keep up with these assignments as they will help you succeed in the course.
 - Grades will be posted on Blackboard as we progress through the course and will help you determine your success to date in the course.
- To ensure that I get messages from you please use Blackboard messaging to send me emails. I will endeavor to check that regularly.
- Jaguar email account: Students are expected to access their Jaguar email accounts routinely as that account will be the other main method for me to communicate with you.
- Annotation of peer-reviewed articles and other readings may be assigned.
- You will have to complete laboratory training at BSL2 to participate in the laboratory session of the course.
- A lab coat will be provided to you and will be stored in the lab.
- A scientific calculator is highly recommended. You will not be permitted to use your phone calculators on exams or quizzes.

Communication

As mentioned above, all students are expected to access Blackboard for updates on the course and to find the course materials. I am available during office hours (student help time) if you need clarification on material and assignments in this course (please use this time!!), and I am happy to make appointments at other times. Use Blackboard email to get in touch with me, and I will respond as soon as possible. Any private information **MUST** come through your JAGUAR email account, not a personal email. And FYI, I do not always check my work email on the weekend so don't expect a response from me.

Grading

This course combines a lecture and laboratory section. These two sections will have different weights in your final grade for the course. **The lecture section will be worth 75% of your course grade. The laboratory section will be worth 25% of your grade.**

The total grade will be calculated by:

$\% \text{ of the available lecture points earned} \times 0.75 + (\% \text{ of the available lab points earned} \times 0.25) = \text{total \% course grade}$

Efforts will be made to return graded exams promptly; however, this may take up to 2 weeks.

Lecture Grade

4 Regular Exams (100 points each)

- Your exams will occur during a regularly scheduled lecture period.

- If you feel that your exam was graded incorrectly, I would be happy to discuss it with you within a week of the exam being returned to you. After that time, the grade will stand.

Homework and Projects (variable points; % value will be adjusted to 100 pts, i.e. worth 1 exam equivalent)

- There will be various assignments throughout the semester worth different point values. You need to do these promptly as they will count towards your participation grade and help me to gauge how you're doing in the course.
- You will complete an individual project.

Final exam (100 points)

- The final will be comprehensive over the material from the entire semester. This will not be a mandatory exam. But I will drop the lowest of your five exams, so this is always a good opportunity to improve your grade.

Final Grade

100 Exam 1

100 Exam 2

100 Exam 3

100 Exam 4

100 Final - will replace the lowest grade

100 Homework Assignments and Project

Out of 500 points

Make-up Policy

Exam Day Attendance: Mandatory. You may make up the exam only if:

- You contact me in writing (email) within 24 hours after the scheduled exam. Notification before the exam is expected unless there are extenuating circumstances.
- Your absence is one approved by TAMU-SA policies (illness, death in the family, or other immediate family emergencies). To be fair to everyone, documentation will be required, unless the absence is due to COVID policies. Acceptance of the excuse is at my discretion.
- You must make up the exam within a week of the original exam date, preferably sooner.

Deadlines:

- In general, late assignments will only be accepted within 24 hrs. of the due date and 20% will be automatically deducted.
- Online homework (designated as HW) assignments can be done late, with a 10% deduction taken automatically online per day late. You can do these assignments even a couple of days late if necessary. Better late than never, and better to get some points rather than a zero!

Lab Attendance: Mandatory

- There will be no provisions made for you to make up a lab as these require hands-on participation.
- Because life happens and sometimes the ability to make it to the lab is impossible, you will be allowed to miss one lab without penalty. Use this excused absence wisely for a true illness or emergency. You will still be responsible for completing any material/assignments and should obtain the information from your lab partner.

- Any student who has missed more than 3 lab periods will fail the laboratory portion of the course.

Classroom Behavior

At the start of the semester, we'll all decide on a classroom behavior agreement. I'll also be sending out a survey to gather some important information on you all so that I can tailor the experience to you.

IMPORTANT POLICIES AND RESOURCES

Academic Accommodations for Persons with Disabilities: Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Support Services in the Central Academic Building, Suite 210, or at (210) 784-1335 or visit <https://www.tamusa.edu/index.html> or email us at dss@tamusa.edu. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Support Services and their instructors as soon as possible.

Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784-1307, or visiting the Central Academic Building, room 202.

Counseling/Mental Health Resources: As a college student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment call 210-784-1331 or visit Madla 120.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services.

Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2'). For more information and self-help resources, please visit www.tamusa.edu/studentcounseling

Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Operations Plan and the Emergency Action Plan can be found here: <https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-operations-plan.pdf> and <https://www.tamusa.edu/about-us/campus-information/safety/university-police-department/documents/emergency-action-plan.pdf>

Download the SafeZone App for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. Tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. Students can schedule appointments through JagWire under the Student Services tab. Click on “Writing, Language, and Digital Composing Center” to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at <https://bit.ly/WLDCCenter>.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Students (DOS@tamusa.edu) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources they may possess.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots’ Casa in-person room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student’s GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as “F” grades and will impact the student’s GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equality of opportunity and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students: Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide reasonable accommodations to pregnant students that would be provided to a student with a temporary medical condition and that are related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784-2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

Students' Rights and Responsibilities: The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges

the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, [Student Code of Conduct](#), on our website, University Catalog and to comply with them, as well as federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide an environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notification.

We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#).

Option 3 – Broader Use of Generative AI Permitted Within Guidelines

Use of artificial intelligence (AI) tools, including ChatGPT, is permitted in this course for students who wish to use them. To adhere to our scholarly values, students must cite any AI-generated material that informed their work

(this includes in-text citations and/or use of quotations, and in your reference list). Using an AI tool to generate content without proper attribution qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

NOTE: Guidance for how to cite AI-generators, like ChatGPT, can be found here

<https://apastyle.apa.org/blog/how-to-cite-chatgpt>

BIOL 4406 Bacteriology Lecture Schedule

Spring 2024

Tentative schedule - Subject to change as the course proceeds. Changes announced in class and/or on Blackboard

Week	Dates	Lecture Topics
1	T: 1/16 R: 1/18	Review syllabus and course expectations and conduct baseline assessment Ch. 1 Evolution of Microbiology
2	T: 1/23 R: 1/25	Ch. 3 Bacterial Cell Structure Ch. 3 continued
3	T: 1/30 R: 2/1	Ch. 3 continued Ch. 7 Bacterial Growth
4	T: 2/6 R: 2/8	Ch. 7 continued Ch. 7 continued
5	T: 2/13 R: 2/15	EXAM 1 (during class time, Ch. 1, 3, 7) Ch. 8 Control of Microorganisms in the Environment
6	T: 2/20 R: 2/22	Ch. 8 continued Ch. 9 Antimicrobial Chemotherapy
7	T: 2/27 R: 2/29	Ch. 9 continued Ch. 10 Intro to Metabolism
8	T: 3/5 TR: 3/7	Ch. 10 continued EXAM 2 (during class time, Ch. 8, 9, 10)
		Spring Break (Mar 11-17 th)
9	T: 3/19 TR: 3/21	Ch. 11 Catabolism Ch. 11 continued
10	T: 3/26 TR: 3/28	Ch. 13 Bacterial Replication and Gene Expression Ch. 13 Continued
11	T: 4/2 TR: 4/4	EXAM 3 (during class time, Ch. 11, 13) Ch. 14 Regulation of Bacterial Cellular Processes
12	T: 4/9 TR: 4/11	Ch 14 continued Ch 14 continued (April 13 th Last day to drop course with a W)
13	T: 4/16 TR: 4/18	Ch. 16 Mechanisms of Genetic Variation Ch 16. (cont.)
14	T: 4/23 TR: 4/25	EXAM 4 (during class time, Ch. 14, 16) Fake News Presentations + Final Paper Due

	May 1-7	Comprehensive Final Exam (TBD as per university schedule)
--	---------	---

Lab Schedule – Subject to change

Date	Topic	Assignment Due
1/18	Introduction to the course: Laboratory Safety and Orientation. <ul style="list-style-type: none"> • The Scientific Method - Making observations and generating hypotheses. • Reading and communicating scientific material 	Get started with Zotero, Join Google Drive, Set up a lab book on Benchling, Start researching & proposal.
1/25	Module 1: Isolation and identification of environmental Bacteria <ul style="list-style-type: none"> • Research proposal design 	Lab meeting participation. Online notebook
2/1	Module 1: Isolation and identification of environmental Bacteria <ul style="list-style-type: none"> • Planning and isolating environmental microbes 	Lab meeting participation. Online notebook
2/8	Module 2: Isolation and identification of environmental Bacteria <ul style="list-style-type: none"> • Identifying surfaces of interest • Swabbing surfaces for DNA and Air Sampling 	Lab meeting participation. Results of Module 1 Discussion. Online notebook
2/15	Module 2: DNA isolation from built environment surfaces. <ul style="list-style-type: none"> • DNA isolation • Colony counting 	Lab meeting participation. Online notebook
2/22	Module 2: DNA isolation from built environment surfaces. <ul style="list-style-type: none"> • Amplicon PCR • PCR Clean-up 	Lab meeting participation. Online notebook
2/29	Module 2: DNA isolation from built environment surfaces. <ul style="list-style-type: none"> • Index PCR • PCR Clean up 2 	Lab meeting participation. Online notebook
3/7	Module 2: DNA isolation from built environment surfaces. <ul style="list-style-type: none"> • Library Quantification • Library Sequencing 	Lab meeting participation. Online notebook
3/21	Module 3: How to analyze microbiome data <ul style="list-style-type: none"> • Using preexisting data 	Lab meeting participation. Results of Module 2 Discussion. Online notebook
3/28	Module 3: Analyzing your data <ul style="list-style-type: none"> • Analyzing the student's data 	Lab meeting participation. Online notebook

4/4	Module 3: Analyzing your data <ul style="list-style-type: none"> Analyzing the student's data 	Lab meeting participation. Online notebook
4/11	Module 3: Analyzing your data <ul style="list-style-type: none"> Analyzing the student's data 	Lab meeting participation. Online notebook
4/18	Module 4: Generating a research poster and communicating your science.	Lab meeting participation. Results of module 3 discussion. Online notebook.
4/25	Module 4: Student Presentation	Final Class Project Presentations