

BIOL 4401-Molecular Biology Lab-1 credit
Texas A&M University-San Antonio
College of Arts and Sciences
Spring 2024 Syllabus

Instructor: Dr. Brenda Rushing

Office: SciTech 311 Phone: 210-784-2212

Office hours: Monday/Wed. 10 a.m. to 11:30 a.m., also Monday 2-3 p.m.

Please schedule appointments through the Calendly app link located on Blackboard.

Email: brushing@tamusa.edu

Class Meeting Times and Location(s)

Lab: Tues 11 a.m.-1:45 p.m. CAB 302

Learning objectives

The student will learn the basic principles of molecular biology of both nucleic acids and proteins. The laboratory portion of the course will provide hands-on experience with experimental scientific principles, as well as illustrate and enhance concepts covered in the lecture course. Students will explore protein structure and function via protein gel electrophoresis and protein purification methods. Students will practice nucleic acid techniques such as DNA extraction, PCR, cloning, restriction enzyme digestion, electrophoresis, restriction mapping, and database searching. The second half of the course will be a several week experiment using these techniques to clone a gene, analyze it, and write a scientific report.

Required Materials

- Most labs will involve handouts and worksheets. They will be provided on Blackboard prior to lab so that you can prepare for lab. I will also bring copies to the lab period itself.
 - *Labs run more smoothly if you come prepared. Pre-lab assignments will be assigned.*
- You will be required every week to bring a bound lab notebook. I will only allow the small composition-type notebook to be used. (Example <https://www.walmart.com/ip/Pen-Gear-Composition-Book-College-Ruled-100-Pages/638273323>) This notebook will mainly be required for maintaining the data from your half semester-long cloning experiment and may be subject to periodic notebook checks. Bring every week!
- Blackboard access: Students are expected to access Blackboard frequently.
 - Lab information will be posted on Blackboard.
 - Important announcements may be posted on Blackboard and are considered equivalent to items announced in class.
 - Grades will be posted on Blackboard. *(Note that I do not do grade calculations within Blackboard; the information is provided so that you can keep up with your course grades throughout the semester. I do grade calculations separately in Excel.)*
- Jaguar email account: **Students are expected to access their Jaguar email accounts** daily as that account will be another main method for me to communicate with you. Due to FERPA regulations, certain private information cannot be handled via your personal email account. General emails (homework question, for example) may be sent to me from your personal account, but occasionally these end up in the junk folder.
- Peer-reviewed articles and other readings may be assigned.
- University laboratory safety agreement must be signed prior to the start of the second lab session and the online quiz completed.
- LAB COAT policy: You will be provided a disposable lab coat that will remain in the lab. You are responsible for keeping it uncontaminated and in good shape for the semester. If you contaminate the coat, you are required to let us know so that we can decontaminate it with bleach, ethanol, or autoclaving as appropriate. You will be shown how to remove your coat

properly, fold it, and place it in a storage bag with your name on it. Bins will be provided for the storage bags. If we determine that your coat is too damaged to be safe, you will be required to purchase a replacement for \$5.

Communication

As stated 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 if you need clarification on material in this course, and I will post a notice on Blackboard or on my door if I am pulled away into a meeting during a scheduled office hour. I am available to make appointments at other times as well. Email is also an excellent way to get in touch with me, and I will respond as soon as possible (usually same day, and no later than 2 business days, except in unusual cases.) Please do not expect responses at 2 a.m. or on weekends right away. Remember that leaving a voice mail on my office phone also generates an email to my tamusa account, and that can be useful when you are unable to access a computer.

Grading

This course combines a lecture and laboratory section. These two sections will have different weight 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:

$$\begin{array}{r} \text{(% of the available lecture points earned X 0.75)} \\ + \quad \text{(% of the available lab points earned X 0.25)} \\ = \quad \text{total \% grade for the course.} \end{array}$$

LAB (Total available ~490 pts.)

Laboratory Exercises

- Your lab grade will consist of the following:
 - Successful completion of the “Avoiding Plagiarism” course 5 pts.
 - Signed lab safety agreement and online lab safety quiz 5 pts.
 - Attendance and active participation each week, including any data analysis, notebook checks, or worksheets assigned. If you do not turn in the assignment or post-lab write-up for a lab, you will lose **half** of the participation points for that lab. 12 weeks X 20 pts = 240 pts.
 - Note: You have one absence allowed with no penalty during the 13-week semester. I do not require you to provide me with an excuse for the “free” absence. Please get the email for your lab partner to obtain any material you have missed. (You are responsible for this material in your report and on quizzes.)
 - If you must miss an additional lab period, but have an approved excuse and documentation, I will determine whether to allow an excused absence. Acceptance of the excuse is at my discretion. This will also be handled in the grades by decreasing the number of available attendance points, thus increasing the weight of all other grades, such as quizzes.
 - If you attend all 13 of the lab weeks, you will receive 10 extra attendance points earned as a bonus (total possible is 250 pts out of 240, more than 100%)
Incentive to attend all labs!
 - TARDINESS: If you are later than **5 minutes** to a lab period, you will lose 4 participation points (i.e. max grade for that lab is a B.) We need everyone to be on time so that we can get the lab started. If you are more than 5 minutes late, you will lose another 2 points for every 5 minutes you are late. No students will be allowed to enter lab after 15 minutes of the start of class.

- Quizzes: 4 quizzes given, but lowest grade dropped. 3 X 20 pts = 60 pts. If you miss a quiz, that will be the grade dropped. You must be on time and in class to take the quiz. No makeups.
 - Pre-lab assignments (due the day before lab, 11:59 p.m.): 10 X 10 pts. = 100 pts.
 - Preliminary draft of methods section: 20 pts.
 - Preliminary data analysis and chart for report: 10 pts.
 - Final lab report (40 pt.) and notebook turn-in (10 pt.) for the cloning lab: 50 pts.
 - Total points for lab: 10+240+60+100+30+50 = 490 pts.
- Note that if you are late for a quiz or leave the lab period prior to completing the assigned lab and being dismissed, you will not be able to make up those points. You are expected to stay the entire lab period unless there is a documented emergency.

Attendance Policy

As the lab is the hands-on portion of the course, attendance is required as detailed in the policy below, and you must participate in discussion, activities and assignments. Roll will be taken every week. If you miss lab, it is your responsibility to obtain notes and any information for that day from a classmate (announcements, assignments etc.) or from Blackboard. You are responsible in your report and/or on quizzes for any material missed.

Quiz Day Attendance: Mandatory (no make-ups allowed).

Lab Attendance: Mandatory (no make-ups allowed, see policy below for missing any labs)

- There will be **no provisions made for you to make up a lab** as these require hands-on participation, and special reagent preparations. If you are going to be absent for a critical step of the cloning lab, you may ask your lab partner to maintain your experiment for you so that you will not get behind.
- 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 the material from that lab on any quizzes.
- Any student who has **missed more than 3 lab periods for any reason (even excused absences) will fail the laboratory portion of the course**. A provision to attend the remaining labs and receive partial credit for the lab may be discussed on a case-by-case basis with the instructor and would require significant reasons and documentation for the absences.
- Acceptance of any provided excuse for missing a lab will be at the instructor's discretion. I require documentation for any excused absence request; this requirement is out of fairness to everyone in the course.

Deadlines:

- Late assignments will only be accepted within 24 hrs. of the due date and 10% will be automatically deducted.

Allowed in-class electronics

- You may photograph notes/diagrams on the dry-erase board. (Cell phones must be disinfected by wiping down with 70% ethanol prior to leaving the lab.)
- A calculator may be used, but is required to be placed in a zip-top bag during lab, and then wiped down with a Kimwipe and 70% ethanol prior to leaving the lab.
- If you would like to audio record lectures, please ask me for permission. Any recordings are for your personal study use only and are not to be posted online. No video recording is allowed.

Classroom Behavior

The bottom line is respect for your peers who are trying to learn, and for me and my time as the instructor.

- Disruptions are to be kept to an absolute minimum—if you have a habit of getting up during class routinely, I will ask you to leave for the day. An occasional trip to the restroom is fine (follow safety procedures), but my preference is for you to take care of that business prior to class. A well-timed question is **always** encouraged and is not considered a disruption.
- Do not leave the lab for the day until you are dismissed. You must tell me if you are leaving for an emergency reason. Do not just disappear for the day. This notification is a safety issue.
- Ear buds and headphones may NEVER be worn during class/lab periods.
- During quizzes and exams, ALL electronic devices (phones, laptops, etc.) must be stored in the cubbies. Attempts to cheat on quizzes or assignments will result in maximum penalty (see below).
- We may discuss controversial topics occasionally. Please abide by common courtesy and listen with respect to the opinions of your peers during class. If a student becomes abusive or disrespectful, he/she will be asked to leave the class or further action must be taken.
- Only students enrolled in the course are allowed in the lab, due to safety concerns. Children are not allowed in the lab.
- If you have a preferred nickname or gender pronoun, please indicate that to me in whatever method is most comfortable for you: after class, via email, during office hours etc.
- If you are a veteran or military-related student with special concerns (deployment, disability accommodations etc.), please let me know. You may also contact the Office of Military Affairs at 210-784-1174.
- No food or drink allowed in the laboratory unless it is in a sealed container in your backpack in a cubby. If you need to step out of lab during a break, you must remove your lab coat, WASH HANDS, get the sealed container or water bottle from your backpack, and take it outside to eat or drink in the hallway. **No open drink cups or coffee/soda cups with temporary plastic lids (i.e. take-out cups) are allowed.**
- ACADEMIC INTEGRITY is vital to the function of a university.
 - Attempts to cheat on quizzes and exams will result in maximum penalty. You will not be allowed to leave the classroom during a quiz. Phones may not be used as a calculator on an exam or quiz.
 - Plagiarism will also result in penalties to the student, including but not limited to a zero on the assignment, failure of the course, or expulsion from the university. Although you have a lab partner, EACH STUDENT is expected to write and turn in their own original work.

IMPORTANT UNIVERSITY 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/WLDCenter>.

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.

Academic Integrity

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.

Academic misconduct for which a student is subject to penalty includes (but is not limited to) cheating, plagiarism, fabrication, multiple submissions, misrepresentation of academic records, facilitating academic dishonesty, unfair advantage, violating known safety requirements, and ethical misconduct.

University policy prescribes serious consequences for acts of academic misconduct including, but not limited to, a grade of 'F' on the particular paper or assignment or a failing grade in the course. Also, a referral may be issued to the Office of Student Rights and Responsibilities where the sanctions can vary up to possible expulsion from the University. Considering the potential consequences of academic misconduct, it is obviously in students' best interests to avoid even the appearance of such behavior. **If you are ever unclear whether a specific act might constitute academic misconduct, please contact your instructor for an assessment of the situation.**

For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#).

No Use of Generative AI Permitted

BIOL 4401 assumes that all work submitted by students will be generated by the students themselves, working individually or in groups when allowed. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Important Dates:

January 16	First day of class
March 11-17	Spring Break – No classes
March 29	Study Day – No classes
April 13	Last day to drop with an automatic "W"
April 20	Last day to drop a course or withdraw from the University
April 29	Last day of classes
April 30	Study Day – No classes
May 1-7	Final exams

The complete academic calendar is available online: <https://www.tamusa.edu/academics/academic-calendar/index.html>

Molecular Biology LAB SCHEDULE-Spring 2024

(**Tentative** schedule-Subject to change as the course proceeds and depending on whether troubleshooting or repeating of experiments is required. Changes will be announced in class and/or on Blackboard.)

Week	Dates	Lab Topics
1	1/23	Lab Safety (Zoom) and pre-lab for week 2
2	1/30	Pipetting practice and accuracy check using balance
3	2/6	GMO food detection (week 1, DNA extraction and PCR)
4	2/13	GMO food (week 2, agarose gel electrophoresis, data interpretation if time)
5	2/20	Quiz 1 GMO food (week 3 if needed, data interpretation, discuss) Discussion and planning for GAPDH lab Aseptic technique and practice culturing bacteria (<i>E. coli</i>)
6	2/27	GAPDH lab (week 1): Plant DNA extraction and set up PCR #1 Quiz 2
7	3/5	GAPDH lab (week 2): Run gel to check PCR#1, perform PCR #2 (nested PCR)
	3/12	Spring Break
8	3/19	GAPDH lab (week 3): Run gel to check PCR#2, purify PCR products
9	3/26****	GAPDH lab (week 4): start <i>E.c.</i> HB101 culture on Monday 3/25 (OPEN lab time) ; ligation, competent cell prep and transformation on Tuesday in lab Quiz 3
10	4/2	GAPDH lab (week 5): Monday 4/1 (OPEN lab time) —choose transformants/potential clones and start liquid cultures; Tuesday in lab--plasmid purification from liquid cultures, restriction digests, agarose gel
11	4/9	GAPDH lab (week 6): Select clones for sequencing, prepare samples for sequencing Discuss final report instructions, methods section assigned
12	4/16	GAPDH lab (week 7): DNA sequence analysis and bioinformatics Methods section due at the start of lab Preliminary data analysis due by Friday, 4/19
13	4/23	Work on final papers Prepare GAPDH sequence data for submission (if possible) Quiz 4
14	4/29	Final summary report due on Monday, 4/29 Notebooks must also be turned in
		Tuesday 4/30 (reading day)