

**BIOL 4401-Molecular Biology-4 credits**  
**Texas A&M University-San Antonio-College of Arts and Sciences**  
**Spring 2025 Syllabus**  
**Instructor: Dr. Brenda Rushing**

Office: SciTech 311M Phone: 210-784-2212 Email: brushing@tamusa.edu  
Student Help Time (aka, office hours): Mon./Wed. 10 a.m.-11:30 a.m. and Tues. 11 a.m.-noon  
Please let me know if you plan to attend office hours by scheduling through my Calendly app:

<https://calendly.com/brushing-appts>

Other times for appointments (Zoom or in person) are available. Please email request when needed.

Note: Regular office hours may be rescheduled due to other meetings.

**Class Meeting Times and Location(s)**

**Lecture:** MWF 9-9:50 a.m. STEM 105

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

**Catalog Description and Prerequisites**

This course focuses in depth on the molecular basis of life (DNA, RNA, and proteins) and the biochemical mechanisms that control expression of information in the cell. Emphasis will be on molecular techniques and experimental data analysis. With laboratory section. Prerequisites: BIOL 2411 Genetics and BIOL 2421 Intro to Microbiology. Recommended: CHEM 2325 Organic Chemistry II.

NOTE: If you have not had organic chemistry, and find that you are in need of more academic support, please contact the science tutors in the Tutoring Center for additional help.

**Learning objectives**

The student will learn the basic and in-depth principles of molecular biology and how genetic information is transmitted and expressed, including replication, transcription, and translation, and importantly, how gene and protein expression are regulated. The student will also learn about various techniques used to study these processes. 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.

**Textbook and LaunchPad-REQUIRED**

***Molecular Cell Biology*** (9<sup>th</sup> ed.) Lodish, et. al. An e-book is provided with the purchase of the Achieve course. The student may purchase the hard-copy book on his/her own, but if an older edition is purchased, the student is responsible for any changes in information. It is expected that the student will read the assigned chapter material *prior* to coming to class in order to participate in the discussions and gain the most out of the lecture period.

**Achieve online system:** We are using Achieve this semester. Reading assignments will be accessed through this online system, as well as homework and/or quizzes.

**Other Required Materials**

- Blackboard access: Students are expected to access Blackboard frequently.
  - The Blackboard app is provided to you FREE by the university.
    - I still recommend that you access BB frequently on a computer as well, since the interface is different and may show you things you missed on the app.
  - Lecture and 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 calculate the grades in Blackboard. They are posted there for your information, and it is the student's responsibility to keep up with how he/she is doing in the course. I calculate the grades offline 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. I cannot discuss personal information with you on your unsecured personal email account.
- 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.
- A lab coat will be provided to you, and will be stored in the lab. It is not to be taken home.
- Small composition book to be used as bound lab notebook (to be discussed in the lab section.) These can be purchased for a nominal price at a dollar store, HEB, etc.

### **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 (which I prefer to call **student help time**) if you need clarification on material in this course, 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 don't expect me to respond at 2 a.m. or immediately on a weekend!

### **Expectations**

**Significant study time outside of class and the recorded lectures is expected.** Being a full-time student is essentially a full-time job, and if you have other commitments you need to manage your time accordingly. The rule of thumb for any course is to spend 2-3 hours per week outside of class for every hour in class. See this website: <https://courses.lumenlearning.com/waymaker-collegesuccess/chapter/text-class-time-to-study-time-ratio/>. Thus, for lecture alone you should spend **9 hours per week studying** outside of class hours (roughly 1 hr. 15 min. per day). Lab would be an added 2-3 h/wk of work outside the attendance in the lab.

### **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:

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

Final grades of 89.5, 79.5 etc. may be rounded up, but grades of 89.4, 79.4 etc. will not be rounded up.

### **Course Structure (~600 total points with some flexibility for added assignments)**

#### **4 Regular Exams** (100 points each; 4 X 100= 400 pts)

- Exams may be a mix of multiple choice, true/false, short answer and essay.
- 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.

#### **1 Final Exam** (100 points)

- This exam is comprehensive and may include any material covered over the course of the semester.

**Homework/Assignments** (equivalent to 100 points; variable pts total will be adjusted to a % to count for 100 pts., i.e. an exam grade. For example, if we have 500 HW points and you earn 400, your grade here would be 80%.)

- There will be various types of assignments throughout the semester worth different point values.
- Most of these will be through the Achieve system. However, they may also include, but are not limited to: problem sets, outside readings with written commentary, a brief class presentation, lecture quizzes etc.
- Learning Curve assignments (pre-reading) are considered preparation for lecture and will be due on the due date itself.
- Online homework assignments need to be completed by the due date itself to receive full credit; however, most assignments will also have an option to do them late with a 10% per day penalty. It is better to do it late, rather than never!
- Most online homework will allow multiple attempts (usually 3) with a small penalty to use them as a learning tool and to improve your grade.
- When allowed (at my discretion), other types of late assignments will only be accepted within 24 hrs. of the due date and 10% will be automatically deducted.

### **Attendance Policy**

You are expected to attend lecture and lab, and participate in discussion, activities and assignments. If you miss class, it is your responsibility to obtain notes and any information for that day from a classmate (announcements, assignments etc.) or from Blackboard, but you may come to office hours for help and clarification on missed material. Excessive absences may result in being dropped from the course.

### **Make-up Policy:**

#### **Exams:**

- You may make up the exam only if:
  - You contact me in writing (email) prior to the exam whenever possible.
    - If there is an extenuating circumstance or emergency, you must contact me within 24 hours after the scheduled exam time, if at all possible.
  - AND your absence is one approved by TAMU-SA policies (illness, death in the family, other immediate-family emergencies; a vacation is not an excused absence). Acceptance of the documentation is at my discretion.
  - You must make up the exam within a week of the original exam date, preferably sooner.

### **Classroom (and online) Behavior**

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

- A well-timed question is **always** encouraged and is not considered a disruption.
- Phones must be on vibrate or turned OFF for the entirety of the class/lab period.
  - If you must take a call during class, DON'T answer the call in the classroom. Leave the room before answering the call. Keep these disruptions to an absolute minimum.
  - Do not text during class; it is distracting to everyone and disrespectful of the academic environment. I will give one warning to cease, and after that I will ask you to leave the class.
- Attempts to cheat on quizzes and exams will result in maximum penalty.
- 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 classroom. No friends, family, etc. unless you clear it with me in advance under an extenuating, occasional circumstance such as a one-day childcare issue. I am generally flexible with these situations, so please ask, but I may not be able to

accommodate your request. If the child is disruptive, you will be asked to leave so as not to disturb the academic environment for others.

### **Preferred nickname and pronouns**

- If you have gender pronouns that you prefer or a nickname, please indicate that to me in whatever method is most comfortable for you: after class, via email, during office hours etc.

### **IMPORTANT UNIVERSITY POLICIES AND RESOURCES**

**Academic Accommodations for Individuals 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, Disability Support Services is located in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us <https://www.tamusa.edu/Disability-Support-Services/index.html> or email us at [dss@tamusa.edu](mailto: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](mailto:tutoring@tamusa.edu), calling (210) 784-1307, or visiting the Central Academic Building, room 202.

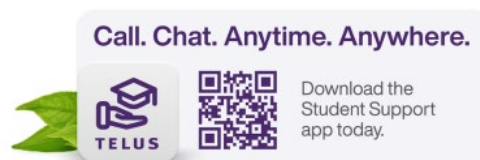
**Counseling/Mental Health Resources:** As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through 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.

For more information on SCC services visit [tamusa.edu/studentcounseling](http://tamusa.edu/studentcounseling)

*Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2').*

Additionally, the TELUS Student Support App provides a variety of mental health resources to including support for in the moment distress, an anonymous peer to peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.



**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/emergency-management/>.

Download the SafeZone App (<https://safezoneapp.com/>) 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. Any student receiving federal financial aid who does not attend by the census date will have their financial aid terminated and returned to the DoE. Please note that any student who stops attending at any time

during the semester, a Care report will be submitted, and you will possibly be dropped from the class. Your financial aid may have to be recalculated and a portion of your federal aid may have to be returned to the DoE.

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://www.tamusa.edu/academics/>.

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 submit a CARE referral (<https://www.tamusa.edu/university-policies/Student-Rights-and-Responsibilities/file-a-report.html>) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots’ Casa building, room 202, or to contact the Office of Military Affairs with any questions at [military.va@tamusa.edu](mailto: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 course 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, equal 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, sexual violence, or other related misconduct, the faculty member must share that information with the university’s Title IX Coordinator ([titleix@tamusa.edu](mailto: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 such reasonable accommodations to pregnant students as would be provided to a student with a temporary medical condition 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](mailto: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, gender identity, gender expression, and pregnancy/parenting 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, and University Catalog, and to comply with them, as well as with 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 a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

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. Conduct that infringes 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 (<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/documents/Student-Handbook-2022-23.pdf>) or visit the resources available in the OSRR website (<https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/academic-integrity.html>).

**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.**

#### **Use of Generative AI Permitted Under Some Circumstances or With Explicit Permission**

There are situations and contexts within this course where you may be asked to use artificial intelligence (AI) tools to explore how they can be used. Outside of those circumstances, you should not use AI tools to generate content (text, video, audio, images) that will end up in any student work (assignments, activities, discussion responses, etc.) that is part of your evaluation in this course. Any student work submitted using AI tools should clearly indicate with attribution what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, students should reach out to their instructor for clarification before submitting work for grading. Use of AI-generated content without the instructor's permission and/or proper attribution in this course 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>

#### **Important Dates:**

January 21	First day of class
March 10-15	Spring Break
April 18 (Friday)	Study Day – No classes
April 21	Last day to drop with an automatic "W"
April 28	Last day to drop a course or withdraw from the University
May 5	Last day of classes
May 6	Study Day – No classes
May 7-13	Final exams (Wed. to Tues.)

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



**Molecular Biology CLASS SCHEDULE—SPRING 2025**  
 (Tentative schedule-Subject to change as the course proceeds.  
 Changes will be announced in class and/or on Blackboard.)

Please look for assignment due dates on Blackboard and Achieve.

Week	Dates	Lecture Topics/Chapter readings
1	1/22-1/24	Syllabus and course expectations Begin Ch. 2 Chemical Foundations (selected parts, this should be review)
2	1/27-1/31	Finish Ch. 2 Ch.3 protein folding (selected parts) Ch. 5 Fundamental Molecular Genetic Mechanisms
3	2/3-2/7	Ch. 5
4	2/10-2/14	Ch. 5 DNA Structure Activity
5	2/17-2/21	Finish Ch. 5 <b>EXAM 1</b> (Ch. 2, selected parts of Ch.3, and Ch. 5) (Wed. 2/19) Ch. 6 Molecular Genetic Techniques
6	2/24-2/28	Ch. 6
7	3/3-3/7	Ch. 6
8		Spring Break (March 10-15)
9	3/17-3/21	Review Ch. 6 <b>EXAM 2</b> (Ch. 6) (Wed., 3/19) Chapter 7 Genes, Chromatin, and Chromosomes
10	3/24-3/28	Chapter 7
11	3/31-4/4	Ch. 7
12	4/7-4/11	Finish Ch. 7 <b>EXAM 3</b> (Ch. 7) (Wed., 4/9) Ch. 8 Transcriptional Control of Gene Expression
13	4/14-4/18	Ch. 8 <i>STUDY DAY-Friday, April 18 (no classes)</i>
14	4/21-4/25	Ch. 8
15	4/28-5/2	Ch. 8 Ch. 9 Post-transcriptional Gene Control (selected parts, if time) <b>EXAM 4</b> (Ch. 8 and selected parts of 9) (Fri. 5/2)
	5/5 (Mon.)	Last day of class-Review for final  <i>STUDY DAY-Tuesday, May 6 (no classes)</i>
		Final exam week 5/7 through 5/13 Final exam (comprehensive) Date: <b>TBD</b> , see university schedule