

**Cell Biology**  
**BIOL 2431\_001\_202610 - 4 credits**  
**Texas A&M University San Antonio**  
**Department of Natural Sciences**  
**Fall 2025 Syllabus**

**Course Instructor:** Dr. Thiya Mukherjee

**Contact:** Email: [tmukherjee@tamusa.edu](mailto:tmukherjee@tamusa.edu) (\*\* best way to contact me, **do not message me on Blackboard**)  
Phone: 210-784-2192  
Office: SciTech/STEM 311N  
Office hours: Monday (3.30-5.30pm or by appointment)

**Class Location, Day and Time:** SciTech/STEM 231, M/W/F- 10.00 -10.50 AM

**Textbook for Lecture \*\*\*REQUIRED\*\*\*:** Essential Cell Biology, 6<sup>th</sup> edition; Follett Access Program, directly through blackboard

**Other required materials:** Must be enrolled in Biol 2431 lab section.  
Must have access to Blackboard: All lecture materials will be uploaded on Blackboard

**Catalog Description:**

**Course Description:** This course provides an in-depth exploration of the molecular and biochemical principles that govern cell structure, function, and regulation. Beginning with an overview of cells as the fundamental units of life, the course examines the chemical composition of cells, the energetic and catalytic mechanisms that sustain life, and the molecular biology of proteins and nucleic acids. Students will investigate how genetic information is stored, replicated, expressed, and regulated, and how evolutionary processes shape genes and genomes. Emphasis will be placed on integrating concepts across molecular and cellular scales to understand the dynamic nature of living systems.

**Learning Outcomes:**

By the end of this course students should at least be able to:

1. Describe the fundamental properties and organization of cells.
2. Explain the chemical building blocks of cells and their roles in maintaining cellular structure and function.
3. Illustrate the principles of energy transduction, enzyme catalysis, and biosynthetic pathways that drive cellular metabolism.
4. Analyze protein structure and function, including the relationship between amino acid sequence, folding, and biological activity.
5. Describe the organization and structure of DNA and chromosomes and explain how genetic information is stored within the genome.
6. Explain the processes of DNA replication and repair and understand their importance in maintaining genome integrity.
7. Outline the central dogma of molecular biology, including transcription, RNA processing, and translation from DNA to protein.

**Course Content (Total points: 600)**

**3 Regular Exams (150 points)**

- Each exam will have 25-50 multiple choice questions

- Each exam will have a total of 50 points
- Thus, total points will be **(50 \*3= 150 points)**.
- If you feel that your exam was graded incorrectly, I would be happy to discuss it with you **when you get back to see your exam during class time**
- All exams **MUST** be returned to the instructor during class time.

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

- The final exam will cover material discussed throughout the semester.

#### Smart work assignments (10\*20=180 points)

- Over the course period there will be 10 smart work assignments. **No late submission permitted.**

#### E book Homework Assignments (10 \*10=100 points)

- On-line homework assignments (Illumine Ebook reading and answering questions) are a way to guide you through sections of your book and help you to assess whether you are understanding the material. These needs to be completed as per the deadlines listed on the schedule provided– deadlines are strict so plan to make sure you complete these on time. **No late submission permitted.**

#### Attendance (70 points)

- I will take attendance every day. 10- minutes late in class will be considered. After that you will be early for next day, as you will miss your attendance for that day.
- Complete attendance will earn you 70 points; 50% attendance will earn you 35 points and anything below that will earn you 0 points

In college, it is expected that for every credit hour you spend in class, you spend 3 hours working on that material at home. This of course takes time-management skills. Please take this into consideration when planning your semester activities.

#### **Attendance policy:**

**Lecture Attendance:** Attendance is must and will be taken daily. Please discuss with me ahead of time if you must miss a class. Do not ask me for make-up material. Make a class buddy for that

**Exam Day Attendance:** Mandatory – If you arrive late, you have only until the end of the period to take it. So, my advice: show up early.

#### **Make up policies:**

**Homework Assignments:** No make up policy

**Smart Work Assignments:** No make up policy

**Exams:** You may make up an exam only if:

- you contact me within **one** day of the scheduled exam. Not earlier than that and no later than one day before.
- your absence is one approved by TAMUSA policies (illness, death in the family, other immediate-family emergencies). Documentation will be required.
- Again – if I do not hear from you within 24 hours of the scheduled exam, you have forfeited the right to make up the exam.
- Make-up exams must be taken within 24 to 48 hours of the scheduled exam. If the scheduled exam falls on a Friday, the make-up exam may be taken the following Monday. No make-up exam will be permitted beyond 48 hours after the original exam time.

**Grading Scale:** (in percentage) (\*\* Scaling up of grade will be done for the next round number if it is 0.5 or above e.g., if your percent score is 79.5 or above, you will get 80%)

- 90-100% = A
- 80-89%= B
- 70-79%= C
- 60-69%= D
- <60% =F

### **Email Etiquette**

Professional email etiquette is a requirement when communicating with me (or anyone) online. Please allow 24 hours for a response during the regular week and 72 hours for a response over the weekend.

### **Important policies and procedures**

**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](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. 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://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 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](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 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](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 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](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, 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](#).

### 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.



**Tentative schedule:** *May subject to change with prior notice*

Month	Day	Topic	Ebook	Smart Work
August	25	Syllabus/Expectation		
August	27	<b>No class, online assignment student expectation</b>		
August	29	Ch.1-Cells, The fundamental units of life	EB 1 assigned	
September	1 (labor day, no class)			
September	3	Ch.1-Cells, The fundamental units of life		
September	5	Ch.1-Cells, The fundamental units of life		
September	8	Ch.2-Chemical components of cells	EB 1 due	SW 1
September	10	Ch.2-Chemical components of cells	EB 2 assigned	
September	12	Ch.2-Chemical components of cells		
September	15	Ch.3-Energy, catalysis, biosynthesis	EB 2 due	SW 2
September	17	Ch.3-Energy, catalysis, biosynthesis	EB 3 assigned	
September	19	Ch.3-Energy, catalysis, biosynthesis		
September	22	<b>Review for Exam 1</b>	EB 3 due	SW 3
September	24	<b>Exam 1</b>		
September	26	Ch.4-Protein structure and function	EB 4 assigned	
September	29	Ch.4-Protein structure and function		
October	1	Ch.4-Protein structure and function		
October	3	Ch.5-DNA and chromosomes	EB 4 due	SW 4
October	6	Ch.5-DNA and chromosomes	EB 5 assigned	
October	8	Ch.5-DNA and chromosomes		
October	10	Ch.6-DNA replication and repair	EB 5 due	SW 5
October	13	Ch.6-DNA replication and repair	EB 6 assigned	
October	15	Ch.6-DNA replication and repair		
October	17	<b>Review for Exam 2</b>	EB 6 due	SW 6
October	20	<b>Exam 2</b>		
October	22	Ch.7-From DNA to protein	EB 7 assigned	
October	24	Ch.7-From DNA to protein		
October	27	Ch.7-From DNA to protein	EB 7 due	SW 7
October	29	Ch.8-Control of gene expression	EB 8 assigned	
October	31	Ch.8-Control of gene expression		
November	3	Ch.8-Control of gene expression		
November	5	Ch.9-How genes and genomes evolve	EB 8 due	SW 8
November	7	Ch.9-How genes and genomes evolve	EB 9 assigned	
November	10	Ch.10-Analyzing gene structure and function	EB 9 due	SW 9
November	12	Ch.10-Analyzing gene structure and function	EB 10 assigned	
November	14	Ch.10-Analyzing gene structure and function		
November	17	<b>Review for Exam 3</b>	EB 10 due	
November	19	<b>Exam 3</b>		SW 10
November	21	Reviewing all three exam papers		
November	24	<b>Review for Final Exam</b>		
November	26	No class, study day		
November	27-29	Thanksgiving break		
December	1	No class		
December	3	<b>Final exam</b>		
December	6-12	Course Complete		