



**BSC 515 Advanced Cell Biology, CRN: 82140 (01W) & 82353 (01B)
Fall 2025**

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eCompanion Site: D2L Brightspace @ MyLeo

Office Hours/Webinars: Mon, Wed, and Fri 2–3 PM via Zoom in D2L.
Or by appointment, include BSC 515 Advanced
Cell Biology in subject line of E-mails.

COURSE OVERVIEW:

This course is designed for graduate students with a thorough background in biology and cell biology. Therefore, this course provides students with a greater understanding of molecular mechanisms of cellular function. Emphasis will be placed on internal organization and cooperative functions of cellular organelles. Understanding of basic methodologies used in cell biology will be sought.

STUDENT LEARNING OUTCOMES (SLO):

At the end of this course students will be able to:

1. Give a broad overview of the chemical basis of life and cellular mechanisms of protein functions regulation.
2. Understand the organization and protein and vesicular transport processes in cells.
3. Describe cytoskeleton and its role in cell migration and adhesion.
4. Describe cell cycle and various cellular death process including necrosis, apoptosis and autophagy

TEXTBOOK

MOLECULAR BIOLOGY OF CELL by Bruce Alberts, 7th Edition, ISBN: 97-80393884821

While you may use this as a reference book, readings of additional materials such as journal articles (will be provided) are necessary for the successful completion of this course.

We will cover lot of subject matter presented in this book, but not necessarily in order. Chapter assignments are listed on the Course Schedule. For some topics, this book presents more detail than we need; however, it omits some topics that will be discussed in the course.

INSTRUCTION METHOD

This syllabus is a suggested outline. It represents the minimum material that we will cover in this course. Dates are approximate and subject to change. If there is any major changes to the syllabus it will be posted in e-

College and the syllabus will be updated accordingly. You are responsible for keeping up with any changes made to the syllabus. *You may be tested on any material listed in the syllabus, on your class page and discussed in class.*

Students participating in the 01B session will join a 1.15-minute in-person session each week. Students in the 01W session are invited to join these sessions through Zoom. It's important for students to review the materials beforehand to ensure that these weekly sessions are productive.

Web-Based Course: The structure of this course is predicated at student reading. Considering enormous volume of information available in genetic engineering, it is impossible to cover everything in a course. *Since it is a summer course it will be rather intense and 2 chapters of reading will be required per week. This means you need to spend a considerable amount of time in studying and integrating the materials.* I have selected these chapters to provide basics in Advanced Cell Biology. PowerPoint slides, additional reading materials as well as activities will be included to help your learning. Your progress in this course will be measured using weekly quizzes, two exams (a mid-term and a final), and a debate topic. You can monitor your progress in D2L Gradebook.

How to Succeed in the Class: For successful course completion, your active and timely participation is essential. As an online class on Advanced Cell Biology, I expect that you have a back ground in cell biology. You must read chapters prescribed for each week and go through additional lecture materials, assignments and activities. From my prior experience, exchanging e-mails are poor strategies of online learning, therefore, *I encourage to clear any questions that you may have during electronic office hours (Tue and Thu 4 PM–5 PM) via the “Zoom” feature available in D2L-Brightspace.*

Class Policies:

In an online class, students are required to be self-learners and self-directed. The fact that you might be taking several online classes and working full time may put additional pressure on you, but would not be considered as a reason for diluting the rigor of this course. **This class will keep the rigor, time line, and standards of a face-to-face class.**

E-mail and Communication: If you are e-mailing me please use your university e-mail account and put BSC 515, Advanced Cell Biology in subject line. If you use an e-mail account without an “.edu” extension, it may end up in my spam folder. During work days, I will respond to e-mails within 24 hrs and e-mails received on weekends will be responded on the next working day. Most of the correspondence will be announced on the course homepage, therefore check course homepage in D2L-Brightspace as-often-as possible.

Electronic Office Hours: You may access office hours on Monday, Wednesday, and Friday at 12 –1 pm CST.

Lecture Materials: Power Point slides that I use for delivering lectures in face-to-face course will be made available in D2L (Brightspace). However, I would like to stress that *Power Point slides that I use for my lectures must not be treated as lecture notes. You may use it as a reference or guide to read the book but not as study material.* If you use PowerPoint slides ONLY for study, you may not perform good in tests. *Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.*

Lecture Materials:

Power Point slides that I use for delivering lectures will be available at eCompanion site for this course at D2L. **Power Point slides are meant for me to deliver lectures and not be treated as lecture notes. You may use it as a reference to read the book but not as a study material.**

Assignments:

1) Quizzes, (120 points total): Throughout the term of this course, 10 QUIZZES will be conducted which needs to be taken online in D2L Each quiz will be due at 11.59 pm on Mondays and contain 10–15 questions and worth of 15 points. If you miss a quiz or perform poorly, there won't be any makeup quiz.

2) Problem Solving Assignments (0 points of total): During this course, you will have access to several problem-solving questions. Tackling these problems on your own is beneficial, as it will strengthen your understanding of the concepts discussed in the course and encourage higher-level thinking. Additionally, some of these questions might be used for multiple-choice and short answer sections of exams. **Problem sets are not graded, so you are not required to submit them**

3) Argumentative Essay (10%): Biology students are expected to be well informed about current issues and cutting edge developments in biology. For this course you are required to complete a 1500 words essay (references would not be counted towards word limit). For elements of a good essay, you may refer the following link <https://www.otago.ac.nz/classics/otago055219.pdf>

Topic	Due Date
Life: a quantum filed process	Oct 31, 2024

Essay is due at 11.59 PM on specified date. The basic tenets of scientific processes must be followed to support your case and information must be from original articles. Essay must be in your own words, while you may cite references, sentences from citation must be paraphrased.

This essay is an argumentative essay not a Persuasive one. Here are some thumb rules on how to write a good argumentative essay.

1 Claim: state your thesis or argument clearly

2 Reasons: your evidence, including data to support your thesis/claim (This require citations).

3 Warrant: the connection between your claim and reasons (requiring you to state assumptions explicitly so there's no confusion)

4 Backing: additional evidence to support your claim (require citations).

5 Qualifier: the limits to your own claim, including concessions (require citations).

6 Rebuttal: addressing opposing viewpoints and criticisms of your claim.

Exams and Grades: For this course there will be three exams including a cumulative final (220 points each, or 22% each) throughout the term. Exam questions will test critical thinking, analytical ability, and the understanding of subject matter. Therefore, it is important to understand the concepts. If you miss an exam for reasons other than university-approved emergencies, make up exams would not be provided. In the event of a makeup examination, it will be provided only in the TAMUC campus, that means you need to travel to the campus.

Grading Policy:**3 exams including the final** = 660 points (76%)

Quizzes = 140 points (14%)

Essay = 100 points (10%)

TOTAL = 1000 points (100%)**Grading Scale:**

A = 900 to 1000 points (>90%)

B = 800 to 899 points (80% to 89%)

C = 700 to 799 points (70% to 79%)

D = 600 to 699 points (60% to 69%)

F = 599 or fewer (<59%)

To calculate where you stand: Your up to date scores and percentage will be available in the grade book of D2L. Add your 3 exam scores, scores in assignments, and your final score of lab and assignment plus any extra credit points that you have, which will be your total score in 1000. Calculate the percentage. This will be your grade.

Course Calendar and Exam Schedule:

Units	Date	Chapters & Subject Matter
Unit 1	Aug 25 –Aug 29	Review of Cells and Organelles Chapter 1 (Development of Cell Theory and Functions of various cell organelles)
Unit 2.1	Sept 01 – Sept 05	Review of biomolecules: Carbon, Water, amino acids, and protein Chapters 2 & 3 (Protein, Carbohydrates, Lipids, and Nucleic Acids)
Unit 2.2	Sept 08 – Sept 12	Review of Macromolecules: Carbohydrates, Lipids, and Nucleic Acids Chapters 2 & 3 (Protein, Carbohydrates, Lipids, and Nucleic Acids)
Unit 2.3	Sept 15 – Sept 19	Review of Bioenergetics and Enzymes (Chapter 2)
Unit 3	Sept 22 – Sept 26	Regulation of Protein Function Chapter 3 (Protein Function)
Unit 4	Sept 29 – Oct 03	Review of Genetic code and Translation Chapter 6 (RNA to Protein)
Exam I, October 10		
Unit 5	Oct 06 – Oct 10	Membrane Structure and Membrane Proteins Chapter 10
Unit 6	Oct 13 – Oct 17	Protein Sorting Chapter 12
Unit 7	Oct 20 – Oct 24	Vesicular Transport and Secretion

		Chapter 13
Unit 8	Oct 27 – Oct 31	Cell-Cell and Cell-Matrix adhesion Chapter 1
Exam II, November 7		
Unit 9	Nov 3 – Nov 7	Cell Cycle Chapter 17
Unit 10	Nov 10 – Nov 14	Cell Death Chapter 18
Unit 11	Nov 17 – Nov 22	Cell Signaling Chapter 15
November 27-28 Thanksgiving Break		
Unit 12	Nov 24 – Dec 5	Cellular Basis of Cancer Chapter 20
Final Exam, December 10		

***ALL DATES AND ASSIGNMENTS ARE TENTATIVE AND MAY SUBJECT TO CHANGE**

Sample Study Week:

Step 1–**Download** lecture slides and supporting materials from D2L

Step 2–**Critically** read chapters and supporting materials, make notes (*simply going through the materials are not going to be enough, focus on concepts, molecular mechanisms etc..*). Attend Webinars or watch recorded sessions.

Step 3–**Complete** assignments if any.

Step 4–**Review materials** and your notes and participate in **office hours** to clear any questions that you may have.

Step 5–Take online **quizzes** in D2L when they are due.

Step 6–**Review again** before the test due date and take online tests.

University’s Pandemic and Adverse Weather Response: “A&M-Commerce students, faculty, and staffs are required follow university’s pandemic and adverse weather response guidelines.

Academic Integrity: A Texas A&M University–Commerce student does not lie, cheat, steal, and does not tolerate those who do. A violation of the Texas A&M honor code and academic integrity involves any of the following offenses: cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity in any of these offenses. The first instance of cheating will results in "**ZERO**" on the exam and/or on the assignment. The second instance of cheating will results in "**ZERO**" on the course. Cheating involves copying information from another student, non-allowable materials or source and plagiarism. Once again, violations of academic integrity will not be tolerated. This class will be conducted in strict observance of the Honor Code. Refer to

your Student Handbook for details.

Conduct Policy: All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See Student's Guide Handbook, Policies and Procedures, Conduct).

Cell Phones/Pagers/Laptop/Tablets: Please turn your cell phone and/or pager (and other electronic devices) off during class. If you are on-call for your work, please place the cell phone or pager on silent or vibration mode. Electronic devices are strictly prohibited in lab.

If you utilize a laptop to take class notes, please be aware of potentially distracting others around you and seat yourself accordingly. Additionally, you may be asked to leave the class if it is determined you are utilizing a computer or electronic device to do outside work, surf the web inappropriately or communicate personal conversations. Texting is prohibited and devices will be collected and kept until the end of class.

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (See Students' Guide Handbook, Policies and Procedures).

Tapes and Notes: While recordings of this class may be made for personal use with prior permission, recordings may not be sold or distributed to others. While you may make copies of these notes for your personal use, no copy of these notes may be distributed to anyone other than persons who are currently enrolled in the class; nor may any copies be sold.

Lab behavior: If handled improperly, some chemicals used in the lab become dangerous. Drinking, eating and the use of electronic devices is PROHIBITED in the lab! Disruptive behavior in lab that could be considered a hazard to another student will result in immediate removal from the lab. Intentionally damaging lab equipment may result in a ZERO for the class and possibly severe financial penalties as many pieces of equipment we will be using are expensive. SEEK HELP If you do not know how to use some instruments (see laboratory syllabus for details)

ACCESS AND NAVIGATION

D2L Brightspace Access and Log in Information

This course will be facilitated using D2L Brightspace, the learning management system used by Texas A&M University-Commerce. To get started with the course, go to [myLeo](#) and from App window select [MyLeoOnline \(D2L Brightspace\) App](#). From home menu choose your course.

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: It is strongly recommended you perform a “Browser Test” prior to the start of your course.

○ TECHNOLOGY REQUIREMENTS

▪ Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

▪ Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

▪ Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari,	The current major version of iOS (the

Device	Operating System	Browser	Supported Browser Version(s)
		Chrome	latest minor or point release of that major version) and the previous major version of iOS (the latest minor or point release of that major version). For example, as of June 7, 2017, D2L supports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
 - 512 MB of RAM, 1 GB or more preferred
 - Broadband connection required courses are heavily video intensive
 - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution
- You must have a:
 - Sound card, which is usually integrated into your desktop or laptop computer
 - Speakers or headphones.
 - *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.
- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site <http://www.java.com/en/download/manual.jsp>
- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.

JavaScript is enabled.

Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
 - [Adobe Reader](https://get.adobe.com/reader/) <https://get.adobe.com/reader/>
 - [Adobe Flash Player](https://get.adobe.com/flashplayer/) (version 17 or later) <https://get.adobe.com/flashplayer/>
 - [Adobe Shockwave Player](https://get.adobe.com/shockwave/) <https://get.adobe.com/shockwave/>
 - [Apple Quick Time](http://www.apple.com/quicktime/download/) <http://www.apple.com/quicktime/download/>
- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

- **COMMUNICATION AND SUPPORT**

- Brightspace Support
- Need Help?
 - Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

- Technical Support

If you are having technical difficulty with any part of Brightspace, contact Brightspace Technical Support at 1-877-325-7778 or click on the click on the words “[click here](#)” to submit an issue via email.



please
Live Chat or

- System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Syllabus Change Policy:

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures:

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf). <http://www.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: [Netiquette](http://www.albion.com/netiquette/corerules.html) <http://www.albion.com/netiquette/corerules.html>

TAMUC Attendance:

For more information about the attendance policy please visit the [Attendance](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx) webpage and [Procedure 13.99.99.R0.01](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx). <http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity:

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

Use of Artificial Intelligence, Open AI, Chat GPT, Chat Bot Software Statement

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. **If no instructions are provided the student should assume that the use of such software is disallowed.**

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

<https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesprocedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

13.99.99.R0.10 Graduate Student Academic Dishonesty

<https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesprocedures/13students/graduate/13.99.99.R0.10.pdf>

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce Gee Library- Room 132

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: Rebecca.Tuerk@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun.

Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url: <http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M- Commerce campuses. Report violations to the University Police Department at 903- 886-5868 or 9-1-1.

Early Intervention:

Early intervention for freshmen is designed to communicate the University's interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester. Additional information about first time undergraduates is available at

<http://www.tamuc.edu/academics/universityCollege/successCoaches/default.aspx>

Behavior: *All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (See Student’s Guide Handbook, Policies and Procedures, Conduct).*

Plagiarism: Plagiarism is a criminal activity. You must cite all sources of information. Unreferenced copying of material, whether parts of sentences, whole sentences, paragraphs, or entire articles can result in a score of zero for your assignment and may result in further disciplinary action. If you are copying material and citing references, you are expected to paraphrase and rewrite the sentences in your own words.