



A&M  
COMMERCE

**BSC 519 Advanced Gene Regulation, CRN: 87082  
Fall 2022**

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eCompanion Site: D2L Brightspace @ MyLeo

Office Hours: Tue and Thu 12 PM – 1.15 PM

Office hrs will be conducted via Zoom in D2L or  
by appointment, include BSC 519 Advanced Gene  
Regulation in subject line of E-mails.

**COURSE OVERVIEW:**

This is a cross listed course designed for graduate students and undergraduate seniors with a thorough background in biology and cell biology. Therefore, this course provides students with a greater understanding of molecular mechanisms of regulation of genes to determine cellular function. Emphasis will be placed on internal organization and cooperative functions of transcription factors and cellular signals. Understanding of basic methodologies used in molecular biology will be sought. Graduate students are expected to demonstrate higher order thinking, analytical, and problem solving skills.

**STUDENT LEARNING OUTCOMES (SLO):**

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

1. Differentiate the key differences between prokaryotic and eukaryotic gene regulation.
2. Understand various molecular mechanisms that control gene transcription and translation.
3. Learn how to critically read, interpret, and summarize the important findings of gene regulation research articles.
4. Use concepts in gene regulation to formulate a project to solve an existing problem or fill existing knowledge gap.
5. Critically analyze and present original research articles in gene regulation.

**RECOMMENDED TEXTBOOKS:**

MOLECULAR BIOLOGY: PRINCIPLE & PRACTICE., 2<sup>nd</sup> Edition, by Michael M Cox,  
ISBN: 9781464126147,

This is a recommended text book and reading material will be provided for most of the units covered in this course, reading of additional materials such as journal articles will be required for the successful completion of this 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 D1L 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 during office hrs/webinars..*

**Web-Based Course:** The structure of this course is predicated at student reading. Considering enormous volume of information available in Stem Cell Biology field, it is impossible to cover everything in a course. ***Since it is an online graduate level course lot of self learning will be involved and a minimum of one chapter of reading and associated work will be required per week. This means you need to spend a considerable amount of time in integrating the materials that been covered in this course.*** I have selected these chapters to provide a thorough understanding in gene regulation. 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, problem solving assignments, and three exams including a final. You may 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 Stem 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, Thu 12 –1.15 PM) via the “YouSeeU-Virtual Classroom” feature available in D2L-Brightspace.***

**Class Policies:** In this 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 it 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 please put BSC 517, Stem 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 during 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). Note that *lecture slides 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 as the main source for your study, you may not perform well in tests. ***Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.***

#### **Grading Policy for Graduate Students:**

3 exams including the final	750 points (75%)
Online Quizzes	110 points (11%)
Problem Solving Assignments	140 points (14%)
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%)

### Overview of Assignments:

**Online quizzes (110 points):** Throughout the term of this course, several quizzes will be assigned online and you need to complete them in D2L Brightspace. These quizzes will consist of either T/F, multiple choice, matching and/or short answer questions. Once you complete them on review date you will be able to see answer key. Quizzes are submitted on or before the due date will be graded. After the due date you won't be able to access quizzes and if you miss them there won't be any make up quizzes.

**Problem Solving Assignments (140 points of total):** Throughout the duration of this course several problems solving questions will be assigned, which will be due in a week after they were assigned. It works for your advantage to solve these problems by yourself, which will increase your success in weekly quizzes and later in exams. Solving problems will augment concepts covered in lectures and help you retain them. Also, some of these questions may serve as the basis for multiple choices and for short answer questions of exams. To receive credits, it is **mandatory to upload a typed copy of the solved problems in D2L in .doc or .docx format on or before its due dates. Hand written copies would not be accepted and** late submissions or problem sets submitted by any other means (E-mail) won't be evaluated.

**Exams and Grades:** For this course there will be three exams including a cumulative final (250 points each, or 25% 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.

**To calculate where you stand:** You can find out up-to-date information from the gradebook in D2L. To manually calculate, find the average of your exam score. To this add your final score of assignments, which will be your total score in 1000. Calculate the percentage. This will be your grade.

### Course Calendar/Exam Schedule

Units	Date	Topic
Unit 1	Aug 29 – Sept 9	Levels of gene expression control Chapter 1 Reading Material (Provided) Review Article (Provided)
Unit 2	Sept 12 – Sept 16	Methods in gene regulation Review Article–Methods for studying the biochemical properties of an Inr (provided) Textbook
Unit 3	Sept 19 – Sept 23	Prokaryotic Transcription (Chapter 15 from the Textbook)
Unit 4	Sept 26 – Sept 30	Eukaryotic Transcription (Chapter 15 from the Textbook)
<b>Exam I – October 7</b>		
Unit 5	Oct 3 – Oct 14	RNA Processing (Provided Reading Material)
Unit 6	Oct 17– Oct 21	Prokaryotic Gene Regulation (Provided Reading Material)
Unit 7	Oct 24 – Oct 28	Eukaryotic Gene Regulation (Provided Reading Material)

Unit 8    Oct 31 – Nov 4            Chromatin Remodeling and Gene Regulation  
(Provided Reading Material and Chapter 10 of the Textbook)

**Exam II – November 11**

Unit 9    Nov 7 – Nov 11            Post-transcriptional Gene Regulation  
(Provided Reading Material)

Unit 10   Nov 14 – Nov 25          Signaling and Gene Regulation  
(Provided Reading Material)

Unit 11   Nov 28– Dec 9            Gene Regulation and Cancer  
(Provided Reading Material)

**Exam III – Final Exam – December 2**

**\*ALL DATES AND ASSIGNMENTS ARE TENTATIVE AND MAY BE SUBJECT TO CHANGES**

**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 Response:** "A&M-Commerce requires the use of face-coverings in all instructional and research classrooms/laboratories. Exceptions may be made by faculty where warranted. Faculty have management over their classrooms. Students not using face-coverings can be required to leave class. Repetitive refusal to comply can be reported to the Office of Students' Rights and Responsibilities as a violation of the student Code of Conduct."

"Students should not attend class when ill or after exposure to anyone with a communicable illness. Communicate such instances directly with your instructor. Faculty will work to support the student getting access to missed content or completing missed assignments."

**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 result in **"ZERO"** on the exam and/or on the assignment. The second instance of cheating will result 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.

## ***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](mailto: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, Chrome	The current major version of iOS (the latest minor or <b>point</b> release of that major version) and the previous major version of iOS (the latest minor or <b>point</b> 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)  
<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 \(version 17 or later\)](https://get.adobe.com/flashplayer/) <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](mailto: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, please contact Brightspace Technical Support at 1-877-325-7778 or click on **Chat** or click on the words “[click here](#)” to submit an issue via email.



#### **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.

## **COMMUNICATION AND SUPPORT**

All e-mail received during normal business hours will be replied within 48 hrs and e-mails received during weekends will be responded on the following Monday.

## **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>

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](#) webpage and [Procedure 13.99.99.R0.01](#). <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>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.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](mailto: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.***