BSC 521 01W & 01B, Epigenetics CRN: 23637, 23638
Spring 2025

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Office Hours: **M, W, F 2–3 PM via Zoom in D2L.**
Or by appointment, include BSC 521, Epigenetics in subject line of E-mails.

Course Overview:
This Epigenetics Course will provide a rigorous foundation in epigenetics. It will emphasize various epigenetics process, how the epigenetic status of the genome forms and maintains, role of epigenetic processes in gene regulation, its involvement in disease development, and recent advances in assessing epigenetic changes of the genome. Based on the review of the seminal works in epigenetics field, this course will familiarize the student with current technology and driving principles of the field of epigenetics.

Student Learning Outcomes (SLO):
At the end of this course students will be able to:

1. Differentiate epigenetic inheritance from genetic inheritance and various methods to assess gene specific and genome wide epigenetic changes.
2. Understand the structure and organization of chromatin and how it plays a role in epigenetic regulation.
3. Understand the role of DNA methylation in epigenetic gene regulation.
4. Understand the connection between epigenetic changes and various disorders including cancer and the clinical use of chemicals that modulates epigenetic processes.

Required Textbook:
Epigenetics by Armstrong (2013), ISBN: 9780815365112

Recommended Reading:
Handbook of Epigenetics, First Edition, 2011, Edited by Trygve Tollefsbol, ISBN: 978-0-12-375709-8, Academic Press Publications, Elsevier Inc. Ebook is available from A&M-Commerce Gee Library. You could also download the electronic version of the book from internet. Note that any editions of this book will work.

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 D2L 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 class session each week. It's important for students to review the materials beforehand to ensure that these weekly sessions are productive. Additionally students in 01B section will have in person exams.

Web-based Course: The structure of this course is predicated at student reading. Considering enormous volume of information available on epigenetics, it is impossible to cover everything in a course. Since it is an online graduate level course, a lot of self-learning is required. A minimum of one chapter of reading and associated work is expected per week. This means you need to spend a considerable amount of time in integrating the materials that been covered in this course. Units included in this course is to provide a thorough understanding in Epigenetics. Additional reading materials will be provided to help your learning. Your progress in this course will be measured using weekly quizzes, assignments, and three exams including a final). You can monitor your progress in D2L Gradebook.

The PowerPoint slides that I utilize for conducting in-person lectures will be accessible on D2L. **Nevertheless, I want to emphasize that these slides are intended for lecture delivery purposes and should not be regarded as lecture notes.** They can be utilized as a point of reference or a guide for reading the book, but not as study material. If you solely rely on the PowerPoint slides for studying, your performance in tests may not be satisfactory.

Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.

How to Succeed in the Class: For successful course completion, your active and timely participation is essential. As an online class on Epigenetics, I expect that you have a back ground in cell or molecular 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 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 please put BSC 521, Epigenetics 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, unless it in an emergency, I will respond to e-mails within 48 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 as-often-as possible.

Electronic Office Hours: You may access office hours on Monday, Wednesday, and Friday at 1 –2 pm CST.

Overview of Assignments:

- **Online quizzes (100 points, 20%):** Throughout the term of this course, several quizzes will be assigned online and you need to complete them in D2L on or before the due date. These quizzes will consist of either T/F, multiple choice, matching and/or short answer questions. You will be able to review answers of the quizzes after the due date of that particular quiz. If you would not complete quizzes on time, you won't be able to access these assignments and there WOULD NOT BE any make up quizzes in case f you miss them.

- **Assignments (100 points, 20%):** The Master's graduate in Biology is expected to be well-informed about current issues and cutting edge developments in biology. For this course you are required to complete two 1000 words essays (references would not be counted towards word limit). You may refer the following link https://www.otago.ac.nz/classics/otago055219.pdf for elements of a good essay.

- As Master's students are expected to develop independent thinking and formulate hypotheses for future research, **the use of AI tools for idea generation, outline creation, and essay writing is not permitted**. If these tools are utilized, it is essential to declare their usage. The use of AI tools will result in a substantial lower score. Additionally, maximum similarity score allowed without references is 12%.

Topic	Due Date	Discussion Due Date
Does Epigenetics Support Lamarckism and Undermine Darwinian Evolution	**Feb 20, 2025**	**Mar 6, 2025**
Epigenetic basis of Long Lasting Transgenerational Inheritance	**Mar 27, 2025**	**Apr 10, 2024**

Essays and discussions are due at 11.59 PM on specified dates. After submission you are required to submit a 100 word summary of your essay in discussion board and each student is expected to participate and actively discuss the topics at hand. As a graduate student, you are expected to demonstrate evidence of cogent and reflective thought while discussing a topic and respectful to others opinions. For an effective discussion, you are required to: 1) submit the summary of your essay 2) read other students' summary and respond to at least one summary, and 3) reply to at least one comment. Other requirements include:

- Posts should be a minimum of 120–150 words.
- Posts should be relevant to the topic being discussed, but should also attempt to introduce a new point of view or piece of information or otherwise further the discussion.
- Posts must be in your own words, while you may cite references, sentences from citation must be paraphrased.

Exams and Grades (300 points, 60%): There will be three exams including the final. Exams will be conceptual based and questions will test critical thinking, analytical ability, and the understanding of subject matter. Therefore, it is important to understand the concepts to perform well in this course. **If you miss an exam other than the reasons of university-approved emergencies make-up exams would not be allowed. In the event of a make-up examination, it may be provided only in the TAMUC campus that means you need to travel to the campus.**

Grading Policy:

Three exams including the Final Weekly Quizzes Assignments & Discussion	=300 points (60%) =100 points (20%) =100 points (20%)
Total	**= 500 points**

Grading Scale:
A = ≥80%
B = ≥70%
C = ≥60%
D = ≥50%
F = ≤40%

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 500. Calculate the percentage. This will be your grade.

Course Calendar and Exam Schedule:

Units	**Topic**	**Date**
Unit 1	Introduction to Epigenetics	Jan 12–16
Unit 2	Review of Eukaryotic Transcription	Jan 19–23
Unit 3	Chromatin organization	Jan 26 – Jan 30
Unit 4	Chromatin Modification	Feb 02 –06
Exam I, Feb 13, 2025		
Unit 5	DNA methylation	Feb 09 – 13
Unit 6	Histone modifications	Feb 16 – Feb 27
SPRING BREAK MARCH 02 – 06, 2025		
Unit 7	Epigenetics & non-coding RNA	Mar 09 – Mar 13
Unit 8	Polycomb and Trithorax in epigenetic regulation	Mar 16 – Mar 27
Exam II, April 03, 2025		
Unit 9	Epigenetics and X-chromosome inactivation	Mar 30 – Apr 03
Unit 10	Epigenetics, Paramutation and Environment	Apr 06 – April 10
Unit 11	Epigenetics and Cancer	April 13 – May 01
Final Exam, May 6, 2025		

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

Sample Study Week:
Step 1–**Download** lecture slides and supporting materials from DocSharing.

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..*)

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

Step 4–**Review material**s 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.

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).
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).*
http://www.tamuc.edu/academics/universityCollege/successCoaches/default.aspx

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.

Piracy: ***Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.***

Students with Disabilities/Reasonable Accommodation: *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
StudentDisabilityServices@tamuc.edu

If you have not taken a course in e-College before, please use the tutorial provided for students in D2L. It

will save you a lot of time and frustration and a lot faster than trial and error.

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	N/A	11

Explorer®		
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 **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, D2Lsupports 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/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time 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, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live 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

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

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/studentDisabilityResourcesAndServ ices/

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/rulesProcedur es/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.