BSC 597 – Gene Regulation (CRN: 82103)

Instructor
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eCompanion Site: eCollege @ MyLeo
Lectures @ BA257
Tue, and Thu 8.00 AM – 9.15 AM
Office Hours
Tue, Thu, and Fri 9.30 AM – 11.30 AM
Or by appointment, include BSC 497 in subject line of E-mails.

Course overview:
This course will provide a rigorous and advanced knowledge in regulation of gene expression so that students will be ready for graduate level courses. This course will emphasize the molecular biology gene expression in eukaryotes. Based on the review of the seminal works in gene regulation, presentations and discussions, this course will familiarize the student with current technology and driving principles of the field of gene regulation.

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, present and summarize the important findings in a research article.
4. Learn how to compare, contrast, and critically analyze contradictory research papers in gene regulation field.

Textbooks:


We will cover most of the subject matter related to gene expression presented in this book. 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.

Attendance and Participation in Class Discussions:

Attendance and active participation in class discussions are expected in all classes. You need to sign the attendance sheet at the beginning of class. Because we will discuss materials outside of text book, it is important to come to class. Your regular attendance and participation in discussions will be taken in account while grading discussion and presentation assignments.
You are responsible for all material and assignments covered in class whether you are present or not.

**Lecture Materials:**
Power Point slides that I use for delivering lectures will be available at eCompanion site for this course at eCollege. Power Point slides are meant for me to deliver the lectures. You may use it as a guide to read the book and/or other reading materials but not as a study material.

**Exams and Grades:**
The lecture part of the course will weigh 60%, and assignments, presentation, and discussions will weigh 40% the total. For the lecture part there will be three exams including a cumulative final (200 points each) throughout the term.

The exam will consist of three parts, multiple choice (50% of total score), short answer, correcting the statements or true or false etc. (50% of total score) and bonus questions (for 10% of total score). Multiple choice questions will test critical thinking, analytical ability, and the understanding of subject matter. Bonus questions may be chose from assignments.

**Grading Policy:**
3 exams including the final = 600 points (60%)

**Assignments**
- Online Quizzes = 100 points (10%)
- Discuss a research paper
  - Discussion Presentation = 100 points (10%)
  - Summary write up = 100 points (10%)
- Compare Research Articles = 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%)

**Overview of Assignments:**
Assignments:
**Online quizzes:** Throughout the term of this course, several (maximum 15) quizzes will be assigned online and you need to complete them in eCollege. These quizzes will consist of either T/F, multiple choice, matching and/or short answer questions. Once you answer and submit them you will see the answers. If you do them during the week (Sunday through Sunday) in which they are assigned you will receive full credit for correct answers on Mondays. If you are late, you won’t be able to access these assignments and there won’t be any make up quizzes.

**Discuss a Research Paper**
I believe active learning and Socratic Method are better ways to learn molecular and cellular biology. So in this course, each student will be assigned with a research paper related to gene expression. While the student with the assigned paper act as the discussion leader for that particular class/topic, all students need to be prepared thoroughly to discuss the experimental procedures and results in the paper assigned. The discussion leader may use PowerPoint slides to provide the background and significance the topic as well as the figures of the research article. In order to stimulate our thinking, the discussion leader also need to post questions for discussion in eCollege, at least a day before the class room discussion or presentation of the topic. In order to lead and participate actively in discussion, each one of you has to make sure you clearly understand the paper assigned for discussion. Your participation in discussion, presentation and how effectively you lead discussion will weigh towards your grade. Once the paper is discussed in the class, the discussion leader needs to submit a summary of the paper and the outcomes of the discussion. The summary write up is due 3 days after discussion.

**Compare Research Articles:**
For this you need to critically analyze and compare 2 research article and summarize differences between the gene regulation mechanism described in the research articles.

**To calculate where you stand:**
You can find out up-to-date information from the gradebook available at the eCompanion site. 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**

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<tr>
<th>Units</th>
<th>Topic</th>
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<tr>
<td>Unit 1</td>
<td>Levels of gene control</td>
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<td>Unit 2</td>
<td>The process of transcription</td>
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<td>Unit 3</td>
<td>Transcriptional control in prokaryotes - operon</td>
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<tr>
<td>Unit 4</td>
<td>Transcriptional control in eukaryotes</td>
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<td><strong>Exam I</strong></td>
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<td>Unit 5</td>
<td>Post-transcriptional processes</td>
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<td>Unit 6</td>
<td>Post-transcriptional Regulation</td>
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<td>Unit 7</td>
<td>Structure of chromatin</td>
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<td>Unit 8</td>
<td>Role of chromatin structure in gene regulation</td>
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<td><strong>Exam II</strong></td>
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<td>Unit 9</td>
<td>Gene Control and Cellular Signaling Pathways</td>
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<td>Unit 10</td>
<td>Control of Cell-type-specific Gene Expression</td>
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<td>Unit 11</td>
<td>Gene Regulation and cancer</td>
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**Exam III**

**Academic Integrity:**
A Texas A&M 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 page on silent mode. 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 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 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 and eating are **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)

**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@tamu-commerce.edu

**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.

**Early Intervention for First Year Students:** 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.