### BIOL 4570 Biochemistry and Molecular Biology of the Gene (3Hrs)

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<tr>
<th>Department of</th>
<th>Life and Health Sciences</th>
<th>Division of</th>
<th>Liberal Arts and Life Sciences</th>
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</thead>
</table>

#### Instructor Name:
Dr. Aubrey Frantz

#### Office Location:
Room 251, Building 2

#### Office Phone:
972-338-1523

#### Email Address:
aubrey.frantz@untdallas.edu

#### Office Hours:
MTWR 9:30 – 10:00am and 12:00 – 12:30pm
(If you need another time, please contact me by email)

#### Classroom Location:
DAL2 room 241

#### Class Meeting Days & Times:
MTWR 10:00 – 11:50am

#### Course Catalog Description:
Biochemistry and Molecular Biology of the Gene. 3 hours. Mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems. May not be used to satisfy minor requirements in chemistry. Prerequisite(s): at least one of the following: BIOL 3451/3452 or 3510/3520.

#### Recommended text:

**ISBN 13: 9780815344544**

#### Access to Learning Resources:
- **UNT Dallas Library:** phone: (972) 780-3625; web: [http://www.unt.edu/unt-dallas/library.htm](http://www.unt.edu/unt-dallas/library.htm)
- **UNT Dallas Bookstore:** phone: (972) 780-3652; e-mail: 1012mgr@fheg.follett.com

#### Course Goals and Student Learning Objectives
At the end of this course, the student will

1. Demonstrate an understanding of biochemical and molecular biology concepts, including mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems.

2. Critically read, analyze, interpret and communicate primary data and literature.

3. Understand the foundations of critical molecular biology methods and understand the capacity and limitations of these methods.

4. Design basic experiments using molecular biology to address a hypothesis as well as expand on current knowledge.
## Course Outline

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated by the instructor in class.

<table>
<thead>
<tr>
<th>TIMELINE</th>
<th>TOPICS</th>
<th>Assignment Due via Blackboard (before class)</th>
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</thead>
</table>
| 6/12     | Course Introduction  
          Early Molecular Biology and the Fundamental Units of Life (Chapter 1) | |
| 6/13     | Proteins (Chapter 4) | |
| 6/14     | DNA + Chromosomes (Chapter 5) | |
| 6/15     | Central Dogma of Biology (Chapter 7)  
          Journal Club #1 - Prokaryotes vs. Eukaryotes (*Karnkowska et al.*, 2016) | Perspective 1 |
| 6/19     | Central Dogma of Biology (Chapter 7)  
          Journal Club #2 – Minimal Bacterial Genome (*Hutchison et al.*, 2016) | Perspective 2 |
| 6/20     | EXAM I | |
| 6/21     | Cell Division (Chapter 18) | |
| 6/22     | Cell Cycle Control (Chapter 18) | |
| 6/26     | Cell Cycle Control (Chapter 18)  
          Journal Club #3 - Tissue regeneration (*Gawriluk et al.*, 2016) | Perspective 3 |
| 6/27     | Apoptosis & Cancer (Chapter 20) | |
| 6/28     | Journal Club #4 – selected cancer article | Perspective 4 |
| 6/29     | EXAM II | |
| 7/3      | Molecular Techniques – Genetic Engineering (Chapter 10) | |
| 7/4      | Independence Day – No Class | |
| 7/5      | Molecular Techniques – DNA Analysis (Chapter 10) | |
| 7/6      | Molecular Techniques – Recombinant DNA and Cloning (Chapter 10) | |
| 7/10     | Journal Club #5 – selected CRISPR article (*Jinek et al.*, 2012)  
          *In Lab transformation and cloning activity* | Perspective 5 |
| 7/11     | *In Lab transformation and cloning activity*  
          Student Presentations  
| 7/12     | Student Presentations | |
| 7/13     | EXAM III | |

### Course Evaluation Methods

You must notify the instructor in advance of any absences due to mandatory professional training and/or professional development. If you miss class due to professional training/development, you are responsible for any missed course content and assignments. **MISSED EXAMS MUST BE MADEUP NO LATER THAN THE NEXT EXAM DATE.** You are responsible for communicating and coordinating makeup exams with the instructor. There are no makeup exams for unexcused absences. *Please use your UNT Dallas email address when communicating with the instructor.*
**Exams** – written tests designed to measure knowledge of presented course material – You will be given three in-class exams. Each exam is worth 100 points. The exams will consist of a combination of multiple choice, fill in the blank and short answer questions. **Attendance is required for all exams.** Any student found cheating on any exam will receive a zero for that exam and may face disciplinary action(s).

**Journal Club** – Several of the course goals and SLO are served by analyzing primary literature. Reading these journal articles exposes you to the process of scientific investigation and recent advancements in the field. Through these readings, you should gain insight into how scientists design experiments to answer hypotheses and into the way scientists analyze data to draw conclusions. **Preparation, attendance and class participation in the journal club is essential.**

**Journal article perspective papers:** Prior to each journal club, you are expected to read the selected paper(s) and write a 1-2 page perspective describing the main findings of the paper and evaluating the research. Instructions for these writing assignments will be posted on Blackboard and distributed in class. Prior to the journal club discussion, your perspectives should be submitted via Blackboard. You must complete 4 perspectives - your lowest perspective grade will be dropped, if you complete 5. **Late perspective papers will not be accepted.**

**Presentation** – You will be required to give an in class presentation on a specific molecular biology topic. This presentation will include a discussion of a primary research article related to the topic. Instructions and guidelines will be discussed in class and posted on Blackboard.

**Reading Quizzes, In class Assignments, and Participation** – short, 5 point quizzes will be given at the beginning of each class. Quizzes will cover the text book material assigned for that class session and/or previous class material. You will have approximately 10 minutes to complete the quiz. There are no make-up quizzes if you are late to class. Additional in class assignments will be administered and graded.

**Grading Matrix:**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Value (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3 x 100 points)</td>
<td>300</td>
</tr>
<tr>
<td>Journal Article Perspectives (4 x 25 points)</td>
<td>100</td>
</tr>
<tr>
<td>Presentation</td>
<td>50</td>
</tr>
<tr>
<td>Attendance &amp; Participation (10 x 5 points)</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
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**Grade Determination:**
- A = 90% or better
- B = 80 – 89 %
- C = 70 – 79 %
- D = 60 – 69 %
- F = less than 60%

**University Policies and Procedures**

**Students with Disabilities (ADA Compliance):**
The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (ADA). Students with documented disabilities are responsible for informing faculty of their needs for reasonable accommodations and providing written authorized documentation. Grades assigned before an accommodation is provided will not be changed as accommodations are not retroactive. For more information, you may visit the Student Life Office, Suite 200.

**Student Evaluation of Teaching Effectiveness Policy:** The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching.
Exam Policy: Exams should be taken as scheduled. No makeup examinations will be allowed except for documented emergencies (See Student Handbook).

Academic Integrity: Academic integrity is a hallmark of higher education. You are expected to abide by the University’s code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University’s policies and procedures. Refer to the Student Code of Academic Integrity at http://www.unt.edu/unt-dallas/policies/Chapter%2007%20Student%20Affairs,%20Education,%20and%20Funding/7.002%20Code%20of%20Academic_Integrity.pdf for complete provisions of this code.

Attendance and Participation Policy: The University attendance policy is in effect for this course. Class attendance and participation is expected because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. The dynamic and intensive nature of this course makes it impossible for students to make-up or to receive credit for missed classes. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class.