BIOL/BIOC 4570/5340: Biochemistry & Molecular Biology of the Gene  
Spring 2021 ● TR 9:30 – 10:50 am ● Remote

Professor: Dr. Calvin A. Henard

Contact Information:  Email: Calvin.Henard@unt.edu  
Office: Science Research Building (SRB), Room 132  
Office Hours: by scheduled zoom appointment

Course Description and Objectives: Principles and concepts of DNA, RNA, and protein, including DNA replication, gene expression and regulation, DNA mutagenesis and repair, and molecular biology techniques utilized in prokaryotic and eukaryotic systems. May not be used to satisfy minor requirements in chemistry.

Course Pre-requisites, Co-requisites, and/or Other Restrictions: At least one of the following: BIOL 3510/3520, 3450 or BIOC 4540.

Student Learning Goals:
1. Demonstrate an understanding of DNA replication and recombination.
2. Explain processes involved in prokaryotic and eukaryotic transcription.
3. Demonstrate an understanding of RNA synthesis, processing, function, and translation
4. Demonstrate an understanding of nucleic acid and protein structure and organization.
5. Explain the mechanisms underlying transcriptional and post-transcriptional regulation in prokaryotes and eukaryotes.
7. Conceptually apply molecular biology techniques.

* Prior editions of the textbook (6th Edition) are also allowed but may not contain all course material.

Attendance: Attendance is expected for all class meetings. Class starts promptly at 9:30 am and ends at 10:50 am. Please do not be late!

COVID-19 Impact on Attendance
While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.
If you are experiencing any symptoms of COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.
**Class Materials for Remote Instruction:** Students will need access to a webcam and microphone to participate in fully remote portions of the class. Information on how to be successful in a remote learning environment can be found at [https://online.unt.edu/learn](https://online.unt.edu/learn).

**Course Technology & Skills:**
Minimum Technology Requirements:
- Computer
- Reliable internet access
- Speakers
- Microphone
- Web Camera
- Plug-ins
- Microsoft Office Suite or other software to generate word document and presentation
  - [Canvas Technical Requirements](https://clear.unt.edu/supported-technologies/canvas/requirements)

Computer Skills & Digital Literacy:
- Using Canvas
- Using email with attachments
- Downloading and installing software
- Using word document programs
- Using presentation and graphics programs

Technical Assistance
Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

**UIT Help Desk:** [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm)
**Email:** helpdesk@unt.edu
**Phone:** 940-565-2324
**In Person:** Sage Hall, Room 130
**Walk-In Availability:** 8am-9pm
**Telephone Availability:**
- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm
**Laptop Checkout:** 8am-7pm

For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328)

**Rules of Engagement**
Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:
While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.

- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Ask for and use the correct name and pronouns for your instructor and classmates.
- Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.
- Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.
- Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Avoid using “text-talk” unless explicitly permitted by your instructor.
- Proofread and fact-check your sources.
- Keep in mind that online posts can be permanent, so think first before you type.

See these Engagement Guidelines (https://clear.unt.edu/online-communication-tips) for more information.

Class Recordings & Student Likenesses
Synchronous (live) sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

Exams: There will be 4 in class exams (exam 4 is given during the final exam period but is not comprehensive). Each in class exam encompasses the material covered during a specific set of lecture dates—this material might vary somewhat from the “estimated” chapters listed below and any changes will be discussed in class. All exams count equally and all 4 of the exams must be taken. Weekly study is expected and waiting until immediately prior to an exam to review course material rarely results in the desired outcome.

- Exams will be available via CANVAS on the indicated exam date between 9am-1pm ONLY. Lockdown browser is required.
- Attendance is required for all exams. There will be no make-up exams, except in cases of emergencies which will be considered on a case-by-case basis.
- Any student found cheating on any exam or quiz will receive a grade of zero (0) for that exam and may face other disciplinary action(s).
- The exam dates are fixed and will not change; however, the content included on each
exam may be different than what is listed in the tentative course schedule. If there are changes to the topics covered on an exam, it will be announced in class and on Canvas. Students will not be tested on concepts that have not been covered in class.

- Students will have one week following the return of graded exams to raise concerns or dispute potential grading errors related to the exam. **After the one week period, the grade is set and can no longer be disputed.**
- **Graduate students** will have additional exam components consistent with graduate level expectations for each exam to be completed by 10pm of the respective exam day. Take home exam components are worth 10% of the exam total; thus, the in class exam portion is worth 90% for graduate students.

**Grading:**
Your final course grade will include 3 in-class lecture exam scores (graduate students will have an out-of-class portion), the final exam score (not comprehensive), and **8 open note/book quizzes** (2 per section). Quizzes are worth 12.5 points. Each exam (including the final exam) is worth 100 points, so there are **500 total possible points** available in this class. Grading will follow a standard scale:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 – 90% (448+ points)</td>
<td>A</td>
</tr>
<tr>
<td>89 – 80% (398+ points)</td>
<td>B</td>
</tr>
<tr>
<td>79 – 70% (348+ points)</td>
<td>C</td>
</tr>
<tr>
<td>69 – 60% (298+ points)</td>
<td>D</td>
</tr>
<tr>
<td>59% &amp; below (&lt; 297 points)</td>
<td>F</td>
</tr>
</tbody>
</table>
### Lecture Schedule for Remote Instruction

<table>
<thead>
<tr>
<th>Lecture Date</th>
<th>Subject</th>
<th>Chapter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Welcome to Mol. Bio.</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Nucleic Acids and the Central Dogma</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>Nucleic Acids and the Central Dogma cont. (Q1 available)</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>DNA Structure</td>
<td>3,4</td>
</tr>
<tr>
<td>26</td>
<td>RNA Structure</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>Protein Structure</td>
<td>6</td>
</tr>
<tr>
<td>February</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Molecular Biology Techniques (Q2 available)</td>
<td>7</td>
</tr>
<tr>
<td>04</td>
<td>Exam Review</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Exam I (covers material through Feb. 2 lecture)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Chromatin</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>DNA Replication</td>
<td>9</td>
</tr>
<tr>
<td>18</td>
<td>DNA Replication cont. (Q3 available)</td>
<td>9</td>
</tr>
<tr>
<td>23</td>
<td>DNA Damage and Repair</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>Homologous Recombination</td>
<td>11</td>
</tr>
<tr>
<td>March</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Site Specific Recombination and Transposition (Q4 available)</td>
<td>12</td>
</tr>
<tr>
<td>04</td>
<td>Exam Review</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Exam II (covers material through March 2 lecture)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Transcription</td>
<td>13</td>
</tr>
<tr>
<td>16</td>
<td>Transcription cont.</td>
<td>13</td>
</tr>
<tr>
<td>18</td>
<td>RNA Splicing</td>
<td>14</td>
</tr>
<tr>
<td>23</td>
<td>RNA Splicing cont. (Q5 available)</td>
<td>14</td>
</tr>
<tr>
<td>25</td>
<td>Translation</td>
<td>15</td>
</tr>
<tr>
<td>30</td>
<td>The Genetic Code (Q6 available)</td>
<td>16</td>
</tr>
<tr>
<td>April</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Exam Review</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>EXAM III (covers material through March 30th lecture)</td>
<td>18</td>
</tr>
<tr>
<td>08</td>
<td>Transcription Regulation in Prokaryotes</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Transcriptional Regulation in Eukaryotes (Q7 available)</td>
<td>19</td>
</tr>
<tr>
<td>15</td>
<td>Regulatory RNAs</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>Post-translational modifications (Q8 available)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Pre-finals day/Exam Review</td>
<td></td>
</tr>
<tr>
<td>April 29 (Thur)</td>
<td>EXAM IV (available on CANVAS 8AM-1 PM) [April 8th through April 20th lectures]</td>
<td>18</td>
</tr>
</tbody>
</table>

Please note this schedule is tentative and subject to change by the instructor. Topics per day may vary, but exam dates are set and will not change.

### UNT Policies

#### Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. [Insert specific sanction or academic penalty for specific academic integrity violation.]

#### ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each
Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)
The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Emergency Notification & Procedures
UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Retention of Student Records
Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student’s records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University’s policy. See UNT Policy 10.10, Records Management and Retention for additional information.

Acceptable Student Behavior
Student behavior that interferes with an instructor’s ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University’s expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's Code of Student Conduct (https://deanofstudents.unt.edu/conduct) to learn more.

Access to Information - Eagle Connect
Students’ access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student’s Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (https://it.unt.edu/eagleconnect).

Student Evaluation Administration Dates
Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 [insert administration dates] of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website (http://spot.unt.edu/) or email spot@unt.edu.

Sexual Assault Prevention
UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and
assistance. UNT’s Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim’s compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565-2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation
To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the Electronic Code of Federal Regulations website (http://www.ecfr.gov/). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G). The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance
To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student’s responsibility to do the following:

1. Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.

2. Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email internationaladvising@unt.edu) to get clarification before the one-week deadline.

Student Verification
UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses (https://policy.unt.edu/policy/07-002).

Use of Student Work
A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student’s permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
Use of the work does not affect any potential profits from the work.

The student is not identified.

The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student’s written permission.

Download the UNT System Permission, Waiver and Release Form

**Transmission and Recording of Student Images in Electronically-Delivered Courses**

1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.

2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.

3. Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

   Example: This course employs lecture capture technology to record class sessions. Students may occasionally appear on video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

**Academic Support & Student Services**

**Student Support Services**

**Mental Health**

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- Counseling and Testing Services ([https://studentaffairs.unt.edu/counseling-and-testing-services](https://studentaffairs.unt.edu/counseling-and-testing-services))
- UNT Care Team ([https://studentaffairs.unt.edu/care](https://studentaffairs.unt.edu/care))
- Individual Counseling ([https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling))

**Chosen Names**

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let the instructor know. Below is a list of resources for updating your chosen name at UNT.

- UNT Records
- UNT ID Card
- UNT Email Address
*Legal Name*

UNT eUIDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.

*Pronouns*

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don’t assume someone’s name, we should also ask and not assume someone’s pronouns.

You can add your pronouns to your Canvas account so that they follow your name when posting to discussion boards, submitting assignments, etc.

Below is a list of additional resources regarding pronouns and their usage:

- What are pronouns and why are they important?
- How do I use pronouns?
- How do I share my pronouns?
- How do I ask for another person’s pronouns?
- How do I correct myself or others when the wrong pronoun is used?

**Additional Student Support Services**

- Registrar ([https://registrar.unt.edu/registration](https://registrar.unt.edu/registration))
- Financial Aid ([https://financialaid.unt.edu/](https://financialaid.unt.edu/))
- Student Legal Services ([https://studentaffairs.unt.edu/student-legal-services](https://studentaffairs.unt.edu/student-legal-services))
- Career Center ([https://studentaffairs.unt.edu/career-center](https://studentaffairs.unt.edu/career-center))
- Multicultural Center ([https://edo.unt.edu/multicultural-center](https://edo.unt.edu/multicultural-center))
- Counseling and Testing Services ([https://studentaffairs.unt.edu/counseling-and-testing-services](https://studentaffairs.unt.edu/counseling-and-testing-services))
- Pride Alliance ([https://edo.unt.edu/pridealliance](https://edo.unt.edu/pridealliance))
- UNT Food Pantry ([https://deanofstudents.unt.edu/resources/food-pantry](https://deanofstudents.unt.edu/resources/food-pantry))

**Academic Support Services**

- Academic Resource Center ([https://clear.unt.edu/canvas/student-resources](https://clear.unt.edu/canvas/student-resources))
- Academic Success Center ([https://success.unt.edu/asc](https://success.unt.edu/asc))
- UNT Libraries ([https://library.unt.edu/](https://library.unt.edu/))
- Writing Lab ([http://writingcenter.unt.edu/](http://writingcenter.unt.edu/))