Genetics BIOL 3451.001

**Fall 2025**

**Time & Place:** Monday/Wednesday/Friday, 9:00-9:50 AM, Chemistry Building (CHEM) 109.

**Lecture delivery will be face-to-face and attendance is expected.**

**Instructor:** Brian Ayre, LSC B318; Tel 940-565-2975; E-mail: [brian.ayre@unt.edu](mailto:brian.ayre@unt.edu)

**SI Leader:** Nadine El-Baghdady

**Please use the Messenger/Email tool in CANVAS for all course-related correspondence**

**Office hours:** Monday and Wednesday, 10:30-11:30 AM (subject to change) or by appointment. Students do not need an appointment for scheduled office hours. Students can attend office hours in person (LSC B 318) or via Zoom (<https://unt.zoom.us/j/89470542894>); reasonable efforts will be made for scheduled office hours to be recorded and broadcast via Zoom. I encourage you to participate in office hours since I am here to help. Students wishing to discuss sensitive issues should make an appointment for a personal meeting through the CANVAS messenger/email tool.

**Objectives:** Genetics (BIOL 3451) is an upper-level (junior) course targeted at Biology Majors with the required prerequisites. Course material will emphasize the three types of Genetics: Transmission (Inheritance) Genetics, Molecular Genetics, and Population Genetics. The course intends to provide a strong background in genetic principles to contribute to your understanding of scientific principles, your in-depth knowledge of the natural world around us, how genetics contributes to societal well-being, and to synergistically contribute to other courses in your university career and beyond.

At the end of the course, students should be able to state modern principles of transmission, molecular, and population genetics; apply modern principles of transmission, molecular, and population genetics to ‘real-world’ scenarios; and decide which principles of modern transmission, molecular, and/or population genetics should be applied to ‘real-world’ scenarios.

**Website:** https://unt.instructure.com/ (CANVAS) is the official web portal for this course. Check this website regularly. It will contain updates to the syllabus, lecture materials, assignments, lecture and office hour recordings (if available), and other official communications as necessary. It is recommended that you go to the website the day before each class and review the material in advance; printing the material and using the printouts to take notes during lectures is an effective strategy to help you learn the material.

**Required materials: The textbook is required. The textbook and associated online resources provide excellent learning tools.**

* Required textbook: **Genetics: A Conceptual Approach,** Benjamin A. Pierce, 6th or 7th edition (either the printed hardcopy or the digital version, rent or buy, ISBN 9781319216801; <https://www.macmillanlearning.com/college/us/product/Genetics-A-Conceptual-Approach>. Refer to the publisher’s website for available options, or contact the UNT Bookstore (Barnes & Noble 8085, University of North Texas; <https://unt.bncollege.com/shop/unt/home>). *Note: we* ***do not*** *use the “Achieve” package in this course*.
* In-class hardware: a smartphone or similar internet-enabled device is recommended as in-class participation will regularly include Zoom polls, iClicker questions (FL25 BIOL 3451.001 Genetics Ayre), or similar technology. A calculator or calculator app on a smartphone with basic scientific functions is recommended for exams.
* Minimum technology requirements include a computer and reliable internet to access course materials and complete assignments through CANVAS (<https://clear.unt.edu/supported-technologies/canvas/requirements>); camera, speakers, and microphone are recommended; various browser plug-ins and Microsoft Office Suite are recommended.
* Minimum computer and digital literacy skills include using CANVAS, using email with attachments, downloading and installing software, basic use of various browser plug-ins, and using Microsoft Office applications.

**Pre-requisites:** Principles of Biology I and II and associated laboratory (or equivalent transfer course) with a grade of C or better. At least 1 lecture/laboratory at the 2000 level (sophomore) and Organic Chemistry I (may be taken concurrently). Entry into the Biology Major satisfies all prerequisites. Consent of the instructor for students lacking one or more prerequisites is on a case-by-case basis.

**Grades:** There will be four **mandatory** non-comprehensive examinations during the semester and a **mandatory** comprehensive final during exam week (see schedule below). The final comprehensive exam and the best three non-comprehensive exams will contribute to the final grade (*i.e.,* the lowest non-comprehensive exam grade will be dropped). Each exam will be scaled to 100 points, for a total of 400 points. Exams will be based on material covered in lectures and the required textbook; some material covered in lectures may not be in the textbook. Picture ID is required for all exams and exams will be proctored face-to-face.

10 homework assignments will be assigned online, roughly one per week. Each homework assignment will be scaled to 10 points for 100 total points.

In-class polls and quizzes will be administered and will contribute to bonus points: 5 points per quarter; 20 points total. In-class polls and quizzes will be administered with iClicker (FL25 BIOL 3451.001 Genetics Ayre); In-class attendance is necessary to participate in iClicker questions.

Final grades will be calculated out of 500 total possible points according to the breakdown below:

A = 451 points and above

B = 401 – 450 points

C = 351 – 400 points

D = 301 – 350 points

F = 300 points and less

**Make-Up Exams:** Exams may only be missed under extenuating circumstances, and must be accompanied by evidence of those circumstances. Make-up exams must be arranged within a week after the missed exam. The instructor must be contacted within 48 hours of the missed exam with the appropriate official documentation to discuss the possibility of a make-up exam.

**Incomplete grades:** As per UNT policy, an incomplete (I) grade is given only if a student is: (1) passing the course; (2) has a justifiable reason why the class cannot be completed on schedule; and (3) arranges with the instructor to finish the course at a later date. All work must be completed within the time specified by the instructor (not to exceed one year after taking the course).

**Cheating Policy:** All exams are to be taken independently. No student will be admitted twenty minutes after the start of an exam and no student may leave during the first thirty minutes. All notes, books, computers, phones, etc., must be stowed during the exam (excluding calculators). Cheating in any form will not be tolerated. Students caught cheating will receive a zero for that grade opportunity and/or the course, at the discretion of the instructor and depending on the severity of the infraction; a note will also be placed in their permanent file. If caught cheating twice they will be permanently removed from the course.

**Attendance:** Attending lectures is required and attendance may be recorded by iClicker. The instructor may deviate from the textbook and material made available on CANVAS (<https://unt.instructure.com>). It is difficult to process all the information presented in lectures and the textbook unless you get it “first hand.” *I cannot stress enough the importance of attending, paying attention, and taking notes during class*. Generally, students who do not attend lectures do poorly.

**Etiquette:** We need to work together to ensure a high-quality teaching and learning environment. Disruptive and inconsiderate activities negatively affect the entire class (including the instructor) and include talking, coming in late, leaving class for non-essential reasons, using cell phones, and general inattentive behavior.

**Illness and health guidelines:** Everyone in the UNT community has a shared responsibility to a healthy environment. If you are experiencing symptoms of a serious communicable diseases, please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your healthcare provider **before** coming to campus. UNT encourages everyone to get vaccinated; face coverings can be worn at your discretion.

Health-related absences and missed assignments constitute extenuating circumstances and accommodations will be made on a case-by-case basis. *Appropriate official documentation will be required for missed assignments and exams*.

**Additional course policies and notes:**

* Assignments must be submitted by the due date and time. Late assignments will be recorded as late and may be refused or points may be deducted at the discretion of the instructor.
* If you think an assignment or exam has been mis-graded, submit a note of explanation to the instructor through the CANVAS messenger tool within one week of receiving the grade. After one week, the instructor will use his/her discretion in reviewing the grade.
* In case of university closure, check the UNT website for schedule adjustments.

**Important dates:** A list of important dates and deadline information can be found on the UNT Registrar’s webpage: <http://registrar.unt.edu/registration/fall-registration-guide>

Students may drop a limited number of courses during their undergraduate career. Consider these limitations carefully before dropping: <https://registrar.unt.edu/registration/dropping-class.html>.

## **UNT Policies**

### **Academic Integrity Policy**

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.

### **ADA Policy**

UNT makes reasonable academic accommodations 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 the 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 before implementation in each class. For additional information see the [ODA website](https://disability.unt.edu/) (https://disability.unt.edu/).

### **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 Blackboard for contingency plans for covering course materials.

**BIOL 3451.001 Genetics; Fall 2024; Lecturer: Brian Ayre**

This is a tentative schedule of topics. **This** **schedule may change without notice.** Changes will be presented in class and posted on CANVAS.

|  |  |  |
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| **Date** | **Lecture** | **Chapter & Topic** |
| Aug 18 | 1 | Syllabus, Ch 1, Introduction to Genetics |
| Aug 20 | 2 | Ch 1: Introduction to Genetics |
| Aug 22 | 3 | Ch 2: Cell cycle, Mitosis, Meiosis, and Gametogenesis |
| Aug 25 | 4 | Ch 2: Cell cycle, Mitosis, Meiosis, and Gametogenesis |
| Aug 27 | 5 | Ch 3: Mendelian Genetics, Monohybrid and Dihybrid Crosses |
| Aug 29 | 6 | Ch 3: Mendelian Genetics, Monohybrid and Dihybrid Crosses |
| Sep 1 |  | Labor Day, campus closed |
| Sep 3 | 7 | Ch 3: Mendelian Genetics, Monohybrid and Dihybrid Crosses |
| Sep 5 | 8 | Overflow and Exam Review (time permitting) |
| **Sep 8** |  | **Exam 1** |
| Sep 10 | 9 | Ch 4: Sex Determination and Sex-linked Characteristics |
| Sep 12 | 10 | Ch 4: Sex Determination and Sex-linked Characteristics |
| Sep 15 | 11 | Ch 5: Extensions and Modifications of Mendelian Inheritance |
| Sep 17 | 12 | Ch 5: Extensions and Modifications of Mendelian Inheritance |
| Sep 19 | 13 | Ch 5: Extensions and Modifications of Mendelian Inheritance |
| Sep 22 | 14 | Ch 6: Pedigree Analysis and Applications |
| Sep 24 | 15 | Ch 6: Pedigree Analysis and Applications |
| Sep 26 | 16 | Ch 6: Pedigree Analysis and Applications |
| Sep 29 | 17 | Overflow and Exam Review (time permitting) |
| Oct 1 |  | **Exam 2** |
| Oct 3 | 18 | Ch 7: Linkage |
| Oct 6 | 19 | Ch 7: Linkage |
| Oct 8 | 20 | Ch 7: Linkage |
| Oct 10 | 21 | Ch 8: Chromosome Variations |
| Oct 13 | 22 | Ch 8: Chromosome Variations |
| Oct 15 | 23 | Ch 10: DNA The Chemical Nature of the Gene |
| Oct 17 | 24 | Ch 10: DNA The Chemical Nature of the Gene |
| Oct 20 | 25 | Ch 11: Chromosome structure |
| Oct 22 | 26 | Ch 11: Chromosome structure |
| Oct 24 | 27 | Overflow and Exam Review (time permitting) |
| **Oct 27** |  | **Exam 3** |
| Oct 29 | 28 | Ch 12: DNA Replication |
| Oct 31 | 29 | Ch 12: DNA Replication |
| Nov 3 | 30 | Ch 19: Molecular Genetic Analysis and Biotechnology |
| Nov 5 | 31 | Ch 19: Molecular Genetic Analysis and Biotechnology |
| Nov 6 | 32 | Ch 19: Molecular Genetic Analysis and Biotechnology |
| Nov 10 | 33 | Ch 25: Population Genetics |
| Nov 12 | 34 | Ch 25: Population Genetics |
| Nov 14 | 35 | Ch 25/26, Population Genetics and Evolutionary Genetics |
| Nov 17 | 36 | Ch 25/26, Population Genetics and Evolutionary Genetics |
| Nov 19 | 37 | Overflow and Exam Review (time permitting) |
| **Nov 21** |  | **Exam 4** |
| Nov 24-28 |  | Fall/Thanksgiving Break; no classes |
| Dec 1 | 38 | Overflow and Exam Review (time permitting) |
| Dec 3 | 39 | Final Exam Review |
| Dec 5 |  | Reading Day, no classes |
| **Dec 10** |  | **Final Comprehensive Exam, 8:00 - 10:00 AM, Wednesday** |

Nov. 8: Last day for a student to drop a course or all courses with a grade of W.

For other important dates related to enrolling, paying fees, adding and dropping classes, etc., refer to the Office of the Registrar: <https://registrar.unt.edu/registration/fall-registration-guide>