

BIOLOGY 3133.001, .002 - GENETICS LABORATORY
Spring 2025

TIME: 001: 2-4:50pm Mon; 002: 2-4:50pm Tue

LOCATION: BEP 139

INSTRUCTOR: Dr. Wei-Chin Ho (who@uttyler.edu)

OFFICE HOURS: 9:30-10:30am Mon & Wed at HPR 115, 12:30-1:30pm Mon & Tue at BEP 139, or by appointment.

TEACHING ASSISTANT:

Elizabeth Boshers (eboshers@patriots.uttyler.edu)

E-MAIL POLICY: When sending an email, please add "**BIOL3133**" at the beginning of the title and clearly indicate your **name** and your **section number (001 or 002)** in the first few sentences of the main text. Please note that the instructor may not be able to respond to emails in two working days.

COURSE FORMAT: This lab course is in a **face-to-face** format. Attendance is required in this course. You will find a calendar with the planned program in this syllabus. Please check Canvas frequently for changes and updates.

COURSE DESCRIPTION: An introduction to experimental and quantitative laboratory techniques fundamental to genetic analysis.

COURSE GOALS:

- 1) To learn and apply concepts of modern transmission and molecular genetics.
- 2) To learn and practice common genetics laboratory and field techniques.

LEARNING OUTCOMES: Upon completion of BIOL 3133, the student should be able to:

- identify different stages and describe chromosomal behaviors in meiosis under microscope
- outline the basic procedures for experimenting with *Drosophila melanogaster*
- generate, recognize, and interpret data that illustrate Mendel's laws and different modes of inheritance
- genetically transform *Escherichia coli*
- extract DNA from tissue
- outline a procedure for conducting a polymerase chain reaction
- use gel electrophoresis to visualize DNA
- name important application of molecular genetic techniques in real life
- use DNA sequences to construct a phylogenetic tree
- use NCBI Blast to search for DNA sequences

MATERIALS: All required materials can be found on Canvas and/or will be provided by the instructors on lab day.

A NOTE ABOUT YOUR GENERAL RESPONSIBILITY IN THE LAB AND SAFETY

PROTOCOLS:

Clean up after yourself. If you use it, put it back; if you dirty it, clean it up; at all times practice safe laboratory practices.

Laboratory Safety and Dress Code: Food and drink are **NOT** allowed in the labs at any time. All students are required to take part in the general safety introduction on the first days and to take an online safety quiz. All students have to follow general safety instructions.

Students are also required to wear the following PPE (Personal Protective Equipment) during all lab sections:

- **Closed-toed shoes must be always worn in the lab.** If you show up to lab with flip-flops, sandals, or other open-toed shoes, you will be asked to leave or must wear departmental rubber boots or waders during the lab time.
- **Long pants must be always worn in the lab.** Please do not show up in shorts, you will be asked to leave or wear full waders during lab.
- **Gloves** are required for some labs. If you leave the lab, you must remove your gloves, and wash your hands, and obtain new ones upon returning.
- **Lab coats** will be provided as needed. These will be new and cleaned each week. We do not need lab coats every week but will let you know for which labs you need to wear a lab coat.
- **Safety goggles** will be provided as needed and must be worn when appropriate.

GRADING:

Item
Pre-lab Assignments – 120 points (10 points x 12)
In-class Assignments – 120 points (10 points x 12)
Post-lab Assignments – 120 points (10 points x 12)
Final Lab Report – 150 points
Final Exam – 150 points
Total - 660 points

Letter grades will be assigned according to the following scale:

A = above 90%

B = 80-89%

C = 70-79%

D = 60-69%

F = below 60%

Prelab Assignments

It is expected that you start the lab prepared for the experiment. Therefore, before each lab, there will be a short reading, online tutorial, etc. to do. There are usually assigned questions to answer on Canvas, likely as a format of short quiz. The submission of pre-lab works is generally through Canvas unless otherwise noted. The prelab assignments are generally due at noon on the lab day, unless there are other instructions. Some labs may require you to hand in a paper assignment at the beginning of the lab. As pre-lab assignments are usually open for many days and meant to be finished before the beginning of the lab, there is no make-up possibility after the due time in general. Please carefully plan your time to finish the pre-lab assignments.

In-class Assignments and Attendance

In this course, we take attendance by signing of your assignments at the end of the lab day. There are no make-up lab days. If you miss a lab unexcused, you will lose the points for that day. If you are missing a lab due to a sport event or a religious event, please let us know in advance. If you realize you are missing a lab because you or your significant family is sick, please let us know as soon as possible too. When the

excuse is legit (such as what is mentioned above) and the official document is available as proof, an alternative online assignment may be available. Please do NOT come to the lab if you are ill.

Post-lab Assignments

Students will practice how to analyze and interpret the data and how to synthesize a meaningful discussion in the experimental context by finishing post-lab assignments. The submission of post-lab assignments is through Canvas unless otherwise noted. The general deadline of post-lab assignment is at noon seven days after the lab day. As post-lab works are open for many days and meant to be finished before the next lab, generally there is no make-up possibility after the due time. Please carefully plan your time to finish post-lab works.

Final Lab Report

The final report is a written document including all parts of a primary research article. You are expected to work on the lab report as a team of three or four students. You will run an experiment for the semester and collect the data needed for the report. Each team is responsible for their own experiment. There will be more detailed instructions on how to write the lab report, and you can ask us for help and feedback at any time during the semester. All members of one team receive the same grade. The submission is generally through Canvas unless otherwise noted.

Final Exam

The course will finish with a lab final exam covering all the materials in the lab.

Corrupted File Policy

Any student that turns in a corrupted file will be given 24 hours to turn in a file that can be opened successfully by the instructor. Failure to do so will earn a grade of "0" (Zero) for the paper.

WHAT IS PLAGIARISM AND HOW CAN IT BE AVOIDED?

Plagiarism may be defined as (1) presenting work, ideas, or phrasing of another, in whole or part, as one's own without giving credit and proper documentation of sources; (2) copying material directly from sources (including electronic media) except when the material is enclosed in quotation marks and the source is clearly identified; (3) paraphrasing too closely to the original, even when the source is identified; and (4) claiming credit for work in any media (electronic, digital, artistic, etc.) where the student is not the original creator of said work. Work that is plagiarized will receive an automatic grade of "F". If you are unsure about this subject, please take the time to talk to your instructor and/or read this:

<https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism>

[Links to an external site.](#)

You will also be required to turn in all written assignments (lab report assignments) in a Word document on CANVAS which will use UNICHECK to assess your paper for Plagiarism. You will find this on your Canvas page for this lab course; each assignment will be compared to previous student work and the work of your classmates! You will only need to turn in a copy of your assignment via the CANVAS Link.

Use of Artificial Intelligence

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased.

Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools

that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, using AI is permitted for most of the components unless noted otherwise.

LABORATORY SCHEDULE (subject to change*)

Week of	Topic
Jan 13	Lab 01: Introduction
Jan 20	<i>No Labs</i>
Jan 27	Lab 02: Mendel's laws
Feb 03	Lab 03: Sex-linked inheritance
Feb 10	Lab 04: Human chromosomes & karyotypes
Feb 17	Lab 05: Genetic mapping
Feb 24	Lab 06: Bacterial transformation
Mar 03	Lab 07: PTC tasting I
Mar 10	Lab 08: PTC tasting II
Mar 17	<i>No Labs</i>
Mar 24	Lab 09: Forensics I
Mar 31	Lab 10: Forensics II
Apr 07	Lab 11: Bioinformatics I
Apr 14	Lab 12: Bioinformatics II
Apr 21	Lab Final Exam
Apr 28	Lab Report Due

*The program and schedule are subject to change, depending on availability of supplies, Covid precautions, etc. Please check the announcements at the beginning of the week for any changes.

Resources to assist you in this course:

- [UT Tyler Student Accessibility and Resource \(SAR\) Office.](#) (provides needed accommodations to students with document needs related to access and learning)
- [UT Tyler Writing Center.](#)
- [The Mathematics Learning Center.](#)
- [UT Tyler PASS Tutoring Center.](#)
- [UT Tyler Supplemental Instruction.](#)
- [Upswing \(24/7 online tutoring\)](#)
- [Robert Muntz Library](#) and [Library Liaison.](#)
- [Canvas 101](#) (learn to use Canvas, proctoring, Unicheck, and other software)
- LIB 422 -- Computer Lab where students can take a proctored exam
- [The Career Success Center.](#)
- [UT Tyler Testing Center.](#)
- [Office of Research & Scholarship Design and Data Analysis Lab.](#)

Resources available to UT Tyler Students:

- [UT Tyler Counseling Center.](#)(available to all students)
- [My SSP App.](#) (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- [Student Assistance and Advocacy Center.](#)
- [Military and Veterans Success Center.](#)(supports for all of our military-affiliated students)
- [UT Tyler Patriot Food Pantry.](#)
- [UT Tyler Financial Aid and Scholarships.](#)
- [UT Tyler Registrar's Office.](#)
- [Office of International Programs.](#)
- [Title IX Reporting.](#)
- [Patriots Engage.](#) (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class - Students, you are allowed to [withdraw](#) (drop) from this course through the [Withdrawal Portal](#). Withdrawing from classes can impact Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please read this page, speak with your instructors, consider your options, and speak with your instructor. UT Tyler faculty and staff are here for our students and often can provide additional support options or student assistance. Please read the implications for withdrawing from a course and the instructions on using the Withdrawal portal on the [Registrar's Withdrawal page](#).

Texas law prohibits students who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and financial aid for additional guidance. CAUTION #1: Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule](#). CAUTION #2: All international students must check with the [Office of International Programs](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms. CAUTION #3: All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. CAUTION #4: All veterans or military-affiliated students should consult with the [Military and Veterans Success Center](#).

Final Exam Policy: Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy: If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade only when all of the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy: Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade; this is separate from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful

actions, appeals may go beyond the Chairperson to the Dean of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the [Registrar's Form Library](#).

Disability/Accessibility Services: In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>, the SAR office located in the University Center, # 3150, or call 903.566.7079."

Military Affiliated Students: UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty members aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center](#) (MVSC) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Academic Honesty and Academic Misconduct: The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

Family Educational Rights and Privacy Act (FERPA): UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities: This course follows the practices related to approved absences as noted by the Student Manual of Operating Procedures ([Sec. 1 -501](#)).

Absence for Religious Holidays: This course follows the practices related to [Excused Absences for Religious Holy Days](#) as noted in the [Catalog](#).

Campus Carry: We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php> .