Course Syllabus

Course Information

Spring 2026

Location: SLC 1.214

Course number BIOL 3320.001 Time: Tues and Thurs 1.00 PM to 2.15 PM

Course number BIOL 3320.002 Time: Tues and Thurs 2.30 PM to 3.45 PM

Instructional Team Contact Information

Dr. Vinita Hajeri

Email: vinita.hajeri@utdallas.edu

Office Room # FN 3.308E

Office hours: Available virtually via Microsoft Teams and in-person. Please email for an in-person appointment.

Monday from 11 AM to noon, starting 2/9 to 5/11. Use the link Join:
https://teams.microsoft.com/meet/21448525807337?p=4J5v3vC6j8CqlGVj53

Friday from 10 AM to 11 AM starting 2/20 to 5/11 Use the link Join:
https://teams.microsoft.com/meet/22829552081554?p=H9u5cvlQ3JER8d9u2D

Sarah Truong, Teaching Assistant

Email: sarah.truong2@utdallas.edu

Office hours: Available virtually via Microsoft Teams and in-person. Please email for an in-person appointment.

Wednesday from 1 PM to 3 PM, starting 2/11 to 5/11. Use the link Join:
https://teams.microsoft.com/meet/21046254374374?p=0wL4XuU3xcWtvg6ql1

Course Pre-requisites, Co-requisites, and/or Other Restrictions

BIOL1, BIOL2 and BIOL Lab

Course Description

Genetic model organisms such as the flatworm (*Planaria*), fruit fly *(Drosophila melanogaster*), nematode (*Caenorhabditis elegans*), and the zebrafish (*Danio rerio*) are the cornerstones of biomedical research. These organisms known for their simplicity of structure and gene similarity to humans have been seminal in advancing our understanding of many biological processes and human diseases. In this inquiry-based course, learners will apply basic principles of genetic model systems, transmission genetics, and molecular genetics to investigate important biological concepts such as embryonic cell division, stem cells and regeneration, Mendelian inheritance, gene mutations and phenotypes. Throughout this exploratory course, students will learn about the practical applications of genetic model organisms in biomedical sciences.

Learners will engage in reading, writing, and discussing scientific breakthroughs to draw connections between the concepts learned in class and their real-time application(s) in biomedical sciences.

Student Learning Objectives/Outcomes

Upon completion of this course students will be able to:

LO1) Explain the use and value of model organisms such as *Planaria, Drosophila, C. elegans* and *Zebrafish* in biomedical sciences for the analysis and elucidation of biological principles and human disease mechanisms.

LO2) Execute basic culturing, handling, and phenotypic analysis techniques of Planaria, Drosophila melanogaster. C. elegans and zebrafish.

LO3) Apply scientific practices by asking questions, planning, and carrying out investigations, collecting and analyzing data, constructing explanations, and engaging in arguments stemming from evidence.

LO4) Examine and synthesize primary literature to extend their thinking or to guide investigations within the context of the course.

LO5) Develop scientific writing skills by working on activity handouts, project reports, and research-based essays.

LO6) Communicate how the course learnings apply to current advancements in biomedical sciences by giving presentations, engaging in discussions, and writing reflections.

Learning Resources

Textbook: This is not a textbook driven class and hence there is no assigned textbook.

The curricular materials have been compiled by the instructor and aim to improve students scientific understanding in the field of Genetics. The following learning resources will be posted on e-learning. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools.

- Handouts that contain background information
- Links to current scientific literature
- Links to videos from the Journal of Visualized Experiments (www.jove.com) and videos from other educational/scientific resources.
- Links to interactives developed by the scientific community.

Class Expectations

- Students will be introduced to the core concepts and their real-world applications in the field of Genetics. Students are required to synthesize conceptual knowledge from the course materials provided and learn about their real-world applications in the field of Genetics and biomedical sciences.
- This course also calls for extensive scientific reading and writing to discuss topics in Genetics. Students are also required to source external peer-reviewed scientific literature to enhance their knowledge about the topics being discussed in the course.
- Students are expected to showcase their learning and understanding through assignments, reflection essays, and by engaging with their peers in discussing topics in Genetics through in-class participation and discussion board postings.
- Students are required to submit their assignments in a prompt and timely manner as per due dates.

Course Mechanics

Attendance

Attendance IS mandatory as is regular class participation and communication with the Teaching Team. *Students will be awarded 54 points at the start of the semester and are allowed 2 free absences. After the free absences are exhausted, 5 points will be deducted for each absence.* If you have a legitimate reason for missing participation (i.e. sickness) it is your responsibility to inform the instructional team (TA and the instructor) as soon as possible and support your absence with appropriate documentation, such as a doctor's note.

Class Materials Fee

The professor has designed a unique class and strives to provide classroom research experiences with living model organisms that are at the forefront of biomedical science. Please note that this is not a lab, hence a laboratory fee cannot be applied. The materials fee is instead of a textbook. There is no textbook for the class, and the instructor provides all the learning materials needed for the class.

All students registered in this class will have to pay a class supply fee of approximately $40. The class supply fee pays the costs for all the live organisms purchased and consumables used (Petri dishes, pipettes, media, and reagents used to culture the live organisms, etc.) for class-research projects.

Please pay the fee at UTD Marketplace- Applied Genetics

Note: The class materials fee is due within the first 2 weeks of class by 2/4/26. Students who do not pay the class supply fee will not be allowed to participate in class projects.

Communication

This course will extensively use e-learning tools such as announcements for communication. All emails to the instructional team should be **addressed to the instructional team**: **Dr. Vinita Hajeri and the TA**. Additional recipients should be included as appropriate. Emails will generally be answered within 24 hours, Monday through Friday during normal business hours (8am–5pm). Emails will not be answered on weekends, so plan accordingly. If you have questions about assignments, please plan ahead of time to allow the instructional team enough time to respond to the request and give feedback.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures. The instructional team documents class participation. Successful participation is defined as consistently adhering to university requirements, as presented in this syllabus. Failure to comply with these University requirements violates the Student Code of Conduct. If you cannot attend class due to covid-19 please inform the instructional team (Dr. Hajeri and the TA) immediately.

Group Work

In-class activities and outside-class work emphasize teamwork and the collaborative aspect of science. Students will be assigned into groups of 3-4 students at the beginning of each model organism unit. All group members are expected to contribute equally to the work. Lack of participation will result in the deduction of participation points. During the semester each team will be generating data as a group, but the actual production of the proposal and written work in

handouts is an individual effort and not a collaboration with others. In situations where the student is unable to complete an assigned task for the group, it is their responsibility to discuss the situation with the group members and the instructor to make necessary alternative arrangements. *Collaborations with peers not registered in the class are not permitted.*

Outside class time:

Drosophila project

The Drosophila project investigates the Mendelian inheritance patterns of an assigned gene mutation, which calls for daily fly husbandry management and close observations of fly generations. The Drosophila project requires each team member to meet outside of class time for a minimum of three periods to complete the fly project. The instructor will assign outside class times, and each team member will be responsible for attending to the fruit flies on the assigned day. All group members should participate in out-of-class work. *Collaborations with peers not registered in the class are not permitted.* Please do not bring friends, past students, or siblings to attend outside of class time.

Zebrafish Project

The zebrafish unit includes an inquiry-based project using zebrafish embryos where students explore the effect of teratogens on developing zebrafish embryos. To complete the project successfully, students are required to come outside of class time. ***See scheduling work outside class time for effective policies***. Participation points will be awarded. A research report will be written discussing the results of the experiment done with the embryos.

Scheduling work outside class time

The instructor tries their best to accommodate each student's schedule and classroom availability while assigning outside class time. The course Google calendar posted on e-learning will showcase the scheduled times for work outside the class period for the Drosophila and zebrafish projects. Students must attend to the project during their assigned times and should communicate to the instructor and their group what procedures were performed and data collected. *A no-show during the assigned outside-of-class work time will lead to a deduction in participation points.*

Class Materials

The instructor will provide class materials that will be available to all students registered for this class, as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Office Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved of Student Accessibility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Activity handouts

These are hard-copy worksheets provided in class to review and learn the content covered in class. To receive full credit for each question, *you must thoroughly address each question*. The handouts are due in class as marked on the class Google calendar. *Students who submit the handout one-week post the due date will receive half credit. Handouts submitted past 2-weeks after the due date will not be graded. Students with unexcused absence will be allowed to work on the handouts at the discretion of the professor for half credit.*

Assignments

Throughout the semester, assignments are posted on eLearning and often involve reading and synthesizing scientific information. Copying and pasting information on eLearning assignments will not be tolerated. All assignments turned in for a grade should be written/performed by the student enrolled in the course. All words written should be original and written by the student. Potential cases of academic dishonesty, whether using internet resources such as chegg.com or similar websites or using AI such as ChatGPT will be documented and submitted to the UT Dallas Office of Community Standards and Conduct. Please check eLearning and your UTD email for notifications regarding these assignments.

TurnItIn submissions on e-learning

We have observed that Turnitin sometimes produces false positives, incorrectly flagging some assignments as AI-generated. To demonstrate a student's own work on Turnitin, all students are required to use Microsoft Word Online or Google Docs to keep a version history of their submissions. If Turnitin indicates a high AI writing score, the student must be able to provide a link to the document so the instructor can review the version history. All students are also advised NOT to use Grammarly and other tools to improve their writing, as they seem to generate false positives for AI writing. All written work submitted should be in the students' own words.

If the instructor cannot verify the version history for a suspicious submission based on Turnitin's similarity or AI writing score, the case will be documented and submitted to the UT Dallas Office of Community Standards and Conduct. Writing assignments should involve synthesizing scientific information and paraphrasing it in students' own words. Students new to scientific writing are strongly encouraged to seek assistance from the UTD Writing Center. Strategies to prevent issues with Turnitin are discussed in class. An "excessive" score that results in a zero for the assignment is determined by a unanimous vote of the instructional staff.

Class periods

Class periods will mainly include the following: Quiz, a short lecture by the instructor, a demonstration by the instructor followed by hands-on activities involving observation and experimentation with living material. At the beginning of each class period, we will have a short discussion about what will be done that day and whether any work outside the scheduled class period will be necessary.

This course requires students to actively engage in class discussions with the instructor and peers. The course is designed for students to capitalize on the discovery aspect of science. Please feel free to help your peers, discuss your findings, and, especially, share viewing of any particularly clear, extraordinary, or spectacular sights you observe with living specimens under the microscope. Whenever possible (time and materials), you will be allowed to make observations more than once. More often, you will see things you didn't see the first time around because now you are more familiar with the subject.

Working with model organisms such as *Planaria, Drosophila, C. elegans,* and *Zebrafish* requires some manual dexterity, which most students can learn with instruction, care, and some practice. Please don't become frustrated if you can't do something right away. It is important to understand that once you have mastered the feat of handling these organisms, it allows you to make interesting observations and perform fascinating experiments to gain a greater understanding of complex biological processes.

Course topics:

A course calendar that shows topics discussed for each class period, assignments due dates, discussion board due dates, and activities due dates will be posted on the e-learning course homepage. The instructor strives to present current and relevant course information engagingly and hence the course topics will be adjusted as deemed necessary by the instructor.

Quizzes and Exams

Students will take quizzes and tests in-class unless the instructor deems it necessary to change the modality in which they will be offered. The quizzes and tests will be timed, and the students are required to prepare for the quiz by reading the assigned material, including watching videos and other materials provided.

Makeup Exams and Quizzes

Make-up quizzes will not be given past one week after the original date for unexcused absences. If a student has an excused absence, they need to discuss their situation with the instructional team.

Per University policy, if a student has three or more exams being given at UTD in one day, the student may request to have an exam moved. The instructional team is happy to accommodate students needing to reschedule an exam, but will **need two weeks' notice minimum**. Students requesting a rescheduled exam will need to supply the instructional team with syllabi from the other courses that are giving exams on the same day. Exams must be taken within a week of the scheduled exam date.

Any other requests for a makeup will be considered on a case-by-case basis and will require appropriate documentation.

Late work Policies

All work must be submitted in a timely manner. A late penalty of 2% per day will apply to late work being submitted to the instructional team for grading. **Assignments submitted more than two weeks past the original due date will not be graded for credit. The last submission for the course must be turned in by May 6th, 2025. Any submissions made post-May 4th will not be graded.**

Grading Policy

Name of Unit	Activities and Assignments	Total points
Model organisms	Assignment - 20 points	20
Stem Cells	Recorded Student Presentations - 50 points	50
Regeneration in Planaria	Data Packet - 20 points Reflection - 30 points Planaria Project Participation-10 points Planaria and Stem cells Quiz - 15 points	75
Genetics Problems Review	Homework - 18 points	18
Drosophila	Draft report - 35 points Final Report - 100 points Fly Project Participation - 100 points Drosophila Quiz - 15 points Mendelian Inheritance worksheet - 10 points	260
C. elegans	C. elegans assignment - 35 points Worm base Activity- 10 points	55
RNAi	RNAi Quiz - 15 points RNAi Group Presentations-75 RNAi Homework- 10 points	95
Zebrafish	Zebrafish Development Activity - 32 points Zebrafish Experiment Data Slide- 10 points Zebrafish Alcohol Research Paper - 70 points Zebrafish project participation points - 25 points Zebrafish Quiz - 15 points	152

Personalized Medicine/crispr-cas9 presentations	Group Presentation- 60 points	60
Midterm		70
Final Exam		70
Attendance		54
Total Points		941

Please note that grading policy is subject to change! Note that adjustments to grading points may be required if the course modality changes and assignments are altered. The instructor tries her best to discuss the latest research findings in class.

Grades scored between	Will equal
97% and 100%	A+
93% and less than 97%	A
90% and 93%	A-
87% and 90%	B+
83% and less than 87%	B
80% and less than 83%	B-
77% and less than 80%	C+
74% and less than 77%	C+
70% and less than 74%	C-
67% and less than 70%	D+
64% and less than 67%	D
60% and less than 64%	D-
0% and less than 60%	F

Course & Instructor Policies

- The teaching team will provide detailed feedback on every submission. Please pay close attention to the feedback to learn the course material effectively.
- Assignments and essays should be submitted in a timely manner.
- Participation on discussion boards is mandatory to earn credit.
- Quizzes and exams must be taken when scheduled.
- Cheating will NOT be tolerated. Anyone caught cheating (all forms) will receive a grade of zero and the matter will be turned over to the Dean of Students.

Instructional Team Responsibilities

To run this course in the most effective manner possible, the members of the instructional team Dr. Hajeri and the teaching assistant for this course work closely on the content and execution of the curriculum. We will provide you with feedback on your proposal, quizzes, handouts, and assignments. Students are required to learn from the feedback and implement the changes to prevent further deductions.

Online Conduct

Participation in virtual learning experiences will require the same, if not a higher, level of professional interaction as is expected in face-to-face classroom environments. Interaction is expected to be respectful and appropriate. As a reminder, students in this course are held to the UTD Student Code of Conduct.

Technical Requirements

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage.

Course Access and Navigation

This course can be accessed using your UT Dallas NetID account on the eLearning website.

Please see the course access and navigation section of the Getting Started with eLearning webpage for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage.

UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The eLearning Support Center includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Class Recordings

Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Distance Learning Student Resources

Students have access to resources including the McDermott Library, Academic Advising, The Office of Student Accessibility, and many others. Please see the eLearning Current Students webpage for more information.

Server Unavailability or Other Technical Difficulties

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the online eLearning Help Desk. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Covid-19 related policies

Visit Comets United webpage to obtain the latest information on the University's guidance and resources for campus health and safety.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

Academic Calendar

Please be aware that the topics listed in the class schedule below are subject to change and should be considered tentative. For the most up-to-date information on assignment deadlines, exam dates, quizzes, and other important dates, please refer to the calendar posted on the eLearning- course homepage. The instructor may make changes to the schedule as necessary.

	Tuesday Topics	Thursday Topics
Week 1	Introduction to Genetic Model Organisms	Model organisms continued
Week 2	Stem Cells and Regeneration	Introduction to Planaria
Week 3	Regeneration in Planaria- experiment set up	Regeneration in Planaria
Week 4	Planaria experiment final day	Genetics Problems
Week 5	Drosophila Melanogaster Introduction and observing wild type flies.	Mendelian Inheritance Patterns worksheet Drosophila Project guidelines
Week 6	Drosophila Project set up. Setting up Crosses	Student exemplar report discussion Drosophila project lab time
Week 7	Chi Square Analysis	Introduction to Caenorhabditis elegans
Week 8	Genetic mutant phenotype analysis in C. elegans and Wormbase.	**Midterm Exam**
Week 9	Spring Break	Spring Break
Week 10	RNA Interference concept and mechanism	RNAi in C. elegans

Week 11	Wormbase Activity, formulating hypothesis. RNAi results discussion	Introduction to Zebrafish
Week 12	Zebrafish Developmental Biology Staging zebrafish embryos and embryo handling	Zebrafish embryo experiment set up
Week 13	Zebrafish embryos experiment start	Zebrafish embryos experiment day 2
Week 14	Zebrafish embryo experiment day	Zebrafish research paper expectations Student Whiteboard discussions
Week 15	Applications in Genetics Personalized Medicine	Applications Genetics. Crispr/cas9
Week 16	**Student presentations**	**Student presentations**
Week 17	**Final Exam (Cumulative)**	