


Biology 3420.001

Genetics Methods

Spring 2016



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Office: Life Science 234

Office Hours: Thurs: 10:00 – 11:30 or Fri: 11:00 – 12:30
Or by appointment

Telephone number: 817-272-9188

Section Information: BIOL 3420.001

Time and Place of Class Meetings:

- Tuesday: 1:00-4:50 PM
- Life Science, Room 330 or B27

Description of Course Content:

This course will be modeled after cutting edge genomics research laboratory where students will use a combination of computational and experimental approaches to see what genomes are made of and how they evolve. The course will be taught in both computational and experimental laboratory settings. Course content will have the theme of selfish genetics elements including transposable elements (TEs), which compromise a staggering amount of genomes. By helping determine the TE content of a genome, students will learn that the genome is more than an instruction manual for making an organism; it is also a historical record of how species evolve. In addition students will learn how TEs are used as molecular tools for gene tagging, functional dissection, mapping, and gene directed therapy.

Note: Genetics Methods is an integrative discipline, incorporating elements of Biology, Genetics, Computer Science, and Writing. We expect that you have at least a basic understanding of each of these elements.

Student Learning Outcomes

1. Understand crucial genome components.
2. Gain a familiarity with genome analysis using a combination of computational and experimental tools.
3. Learn the scientific process by designing and conducting experiments, collecting and analyzing data, and presenting results, in both written and oral formats
4. *Critical Thinking Skills:* to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information;
5. *Communication Skills:* to include effective development, interpretation and expression of ideas through written, oral and visual communication
6. *Empirical and Quantitative Skills:* to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
7. *Teamwork:* to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Course Components and Syllabus Structure: This syllabus describes policy, procedures, and content for both the lecture and laboratory components of this course.

Expectations:

Attend class regularly and participate in discussions. Show up and be prepared to learn. Be courteous and respectful to your fellow classmates.

Recommended Textbooks and Other Required Course Materials:

- Materials and Announcements can be accessed on Blackboard <https://elearn.uta.edu/>

Grading: Students will be graded on laboratory notebooks, participation, lab reports and presentations.

- University policy prohibits extra credit in any form for lecture.
- Your lecture grade will be determined as follows:
 - Class Participation – 10%
 - Assignments - 20%
 - Lab notebook – 20%
 - Paper draft sections – 20%
 - Final Paper - 30%

Determination of Final Grade:

89.5+ = A
 79.5-89.4 = B
 69.5-79.4 = C
 59.5-69.4 = D
 Less than 59.5 = F

INDIVIDUAL COMPONENT GRADES WILL NOT BE CURVED. Any class-wide grade adjustments (if deemed appropriate) will be applied at the end of the course, after all lecture and lab grades are available.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an **additional six hours per week of their own time** in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Important Dates:

- Spring Break:** Monday, March 14th – Friday, March 19th
- Last day to withdrawal:** Friday, April 4th all requests need to be submitted by 4:00PM

American with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA).

All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office of Students with Disabilities at (817) 272-3364.

Students with Disabilities: If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

Title IX: The University of Texas at Arlington is committed to upholding U.S. Federal Law “Title IX” such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

ACADEMIC INTEGRITY: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Series 50101, Section 2.2).

All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

I WILL NOT TOLERATE CHEATING IN ANY FORM. IF YOU ARE CAUGHT, YOU WILL NOT RECEIVE CREDIT FOR THAT ASSIGNMENT AND WILL BE REPORTED TO THE OFFICE OF STUDENT CONDUCT.

STUDENT RESPONSIBILITIES:

- A. Familiarize yourself with course syllabus. **YOU** are responsible for this information.
- B. Memorize your lecture section and your professor's and UGTA's names.
- C. **Write your entire name and student ID on anything you turn in to the instructor.**
- D. Show respect for instructor and fellow students at all times.
- E. Adhere strictly to standards of academic honesty, cheating results in an automatic F in the course.
- F. Attend class regularly, **on time**, and remain the entire class period.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Students are responsible for checking their email regularly.

***Email Note:** When emailing me, be sure to **include your entire name, your class number and your section**. I will not read the email if this information is not available. Be professional and courteous. You should always address your professors as: Professor or Dr. and include your full name.

BLACKBOARD: **You are responsible for checking Blackboard on a regular basis.** All class notes; grades and information, including this syllabus can be found on Blackboard. If you have any questions, **please check Blackboard first**, if you still cannot find the information you are looking for, then you may email me. **To access blackboard:** elearn.uta.edu

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

SOAR TUTORING: SOAR (Students Obtaining Academic Readiness) is located in 132 Hammond Hall and offers free academic support for qualifying students and low-cost services for all students, including Cost Share Tutoring.

Writing Center. : The Writing Center, 411 Central Library, offers individual 40 minute sessions to review assignments, *Quick Hits* (5-10 minute quick answers to questions), and workshops on grammar and specific writing projects. Visit <https://uta.mywconline.com/> to register and make appointments. For hours, information about the writing workshops we offer, scheduling a classroom visit, and descriptions of the services we offer undergraduates, graduate students, and faculty members, please visit our website at www.uta.edu/owl/.

Additional services:

Library Home Page	http://www.uta.edu/library
Subject Guides	http://libguides.uta.edu
Subject Librarians	http://www.uta.edu/library/help/subject-librarians.php
Database List	http://www.uta.edu/library/databases/index.php
Course Reserves	http://pulse.uta.edu/vwebv/enterCourseReserve.do
Library Tutorials	http://www.uta.edu/library/help/tutorials.php
Connecting from Off- Campus	http://libguides.uta.edu/offcampus
Ask A Librarian	http://ask.uta.edu

The following URL houses a page where we have gathered many commonly used resources needed by students in online courses: <http://www.uta.edu/library/services/distance.php>.

The subject librarian for your area can work with you to build a customized course page to support your class if you wish. For examples, visit <http://libguides.uta.edu/os> and <http://libguides.uta.edu/pols2311fm> . If you have any questions, please feel free to contact Suzanne Beckett, at sbeckett@uta.edu or at 817.272.0923.

FINAL REVIEW WEEK: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabi. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. Classes are held as scheduled during this week and lectures and presentations may be given.

Drop Policy: Students may drop or swap (adding & dropping a class concurrently) classes through self-service MyMav from the beginning of registration through the late registration period. After the late registration period, students must see their **academic advisor** to drop a class or withdraw. **Undeclared** students must see an advisor in the University Advising Center of the second floor of Davis Hall. Drops can continue through a point two-thirds of the way through the term or session.

It is the student's responsibility to officially withdraw if they do not plan to attend after registering. *You* are responsible for seeing that all of the proper paperwork is completed and submitted to the appropriate university officials. If this paperwork is not completed, you will receive a letter grade corresponding to your earned grade, including zeros for all missed work. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

As a result of recent legislation passed by the Texas Legislature, any student who enrolls in a public institution of higher education as a first-time freshman in Fall 2007 or later will be limited to six dropped courses during the course of their academic career. This applies to UTA course work and course work completed at other Texas public institutions. In addition, a student can only attempt the same course two times. On the third attempt, the student will be charged the equivalent of out-of-state tuition for the course.

Student Feedback Survey: At the end of each term, students enrolled shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located out the doors to the left. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

BOMB THREATS: If anyone is tempted to call in a bomb threat, be aware that UTA will attempt to trace the phone call and prosecute all responsible parties. Every effort will be made to avoid cancellation of presentations/tests caused by bomb threats. Unannounced alternate sites will be available for these classes. Your instructor will make you aware of alternate class sites in the event that your classroom is not available.

AFTER HOURS SAFETY ESCORT: The Sam Mav Escort service provides a service to assist students, faculty, staff and campus visitors to reach their destinations after regular business hours. The hours of service are 7:00 p.m. to 1:00 a.m., Sunday through Saturday. 817-272-3381

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.

LAB INFORMATION: You must complete the online safety training **BEFORE** your class begins.

Mandatory Online Safety Training:

1. Login to **Blackboard** at <https://elearn.uta.edu> with your NetID and password.
2. Under **My Blackboard** tab, click **Lab Safety Training**.
3. Click **Welcome** from the left pane to start and follow the instructions.
4. Lab Safety Training is required to be completed once every academic year. Training completed in the Fall semester is valid for the Fall, Spring and Summer sessions.
For training specific questions, contact the Environmental Health and Safety office at 817-272-2185.
For technical assistance with the training, please contact the Office of Institutional Compliance at 817-272-5100 or email compliance@uta.edu

The laboratory is designed to provide all students with opportunities to investigate biological processes in an inquiry-based fashion. Students will be expected to work as teams in lab groups (usually of four students) to conduct experiments and participate in the scientific process.

Lecture Schedule (topics and exams): Timing of due dates is approximate and may be adjusted according to our progress. You will be notified of upcoming exams at least two weeks in advance. There is no excuse for "not knowing" that deadline is coming up!

This information is going to come at you fast in more detail than you are accustomed to. These are major differences between high school and college. If you do not study and prepare independently, you will fall behind quickly.

Tentative Schedule:

Unit 1: Bioinformatics and Sequence Analysis

Unit 2: Mendelian Genetics

Unit 3: Genetic Variation

Unit 4: Gene Regulation

Notes for Success in Genetics Methods:

1. Attend *every* lecture. The topics covered in this course build on each other; missing class will quickly put you behind.
2. **Prior** to class, read the laboratory that will be completed.
3. Review your lecture notes after each class. Note topics, which require further study or clarification.
4. Work the problems in the back of the chapter.
5. Spend the necessary amount of time studying. The rule of thumb for succeeding in Biology is **three hours of study for every hour of lecture**. This means that at a minimum you should plan to study **nine hours each week**, outside of lecture and lab.
6. Don't procrastinate. These concepts take time to sink in and apply.
7. Check Blackboard and your UTA email on a regular basis.
8. Get organized. Put important dates in your planner today and make a study plan.