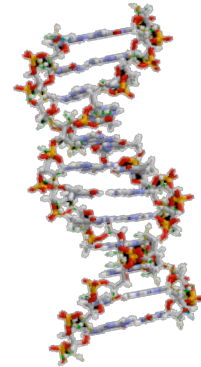


Biol 3317 – Genomics Biol 5335 - Essentials of Genomics

Spring 2017



Professors: Dr. Matthew K. Fujita & Dr. Todd Castoe

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Faculty Profiles:

Dr. Fujita: <https://www.uta.edu/profiles/matthew-fujita>

Dr. Castoe: <https://www.uta.edu/profiles/todd-castoe>

Office Hours:

Dr. Fujita – Tuesday 1 pm - 2 pm (from 1/17/17 – 3/7/17)

Dr. Castoe – Tuesday 1:30 pm – 2:30 pm (from 3/7/17 – 5/9/17)

Section Information: Biology 3317.001 (undergraduates)
Biology 5335.001 (graduate students only)

Class time and place: T,Th 11:00-12:20 am, SH 332

Course description: This course will explore several aspects of genome biology, including the evolutionary principles that influence how genomes change through time, genome structure, and genome function. Emphasis will be given on how genome technology influences the way we do modern biology and how genomics influences the world around us.

Student outcomes: This course will prepare you with a general knowledge of genomes - how they evolve, how they function, and how they are structured. At the end of the course, you should understand: how evolutionary processes, such as natural selection and genetic drift, influence genome diversity; the way genomes are structured at multiple levels, including nucleotide, gene, and repetitive element compositions, to higher levels including three dimensional structures and karyotypes; how life history characteristics influence genomes, such as asexuality; how genomes function, including their regulation and transcriptional activity; and finally, how scientists sequence and analyze genomes today.

Prerequisite: You need to have a solid understanding of genetics, with a grade of B or better from BIOL3315.

Textbook: There is no required textbook.

Course Website: Blackboard (<https://elearn.uta.edu>)

Description of major assignments and examinations: This course will consist of weekly activities (including group activities) that altogether will comprise 50% of your grade. These activities will require access to the Internet during class, and thus a computer or mobile device will be required for group activities. Two take-home exams will also be administered, for a combined total of 50% of your grade. The exams are mandatory and will require access to the Internet.

Evaluation:

Your grade will be based on activities (50%) and exams (50%). Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

$\geq 90\%$ = A
89-80% = B
79-70% = C
69-60% = D
 $< 60\%$ = F

Exam, homework, and credit policy:

The exams are due by the specified date on the schedule without exception. We provide ample time to complete these exams, and thus late exams will be penalized. This penalty will be 10% off of the grade PER DAY (including weekends). Activities will be due by the date specified on the assignment sheet handed out in class.

Graduate students (Biol 5335 ONLY): Graduate students will be required to write a short (2-page) research proposal on a genomics topic of your choice. A separate handout will provide details of this project. Your grade will be based on the midterm (20%), the final exam (20%), activities (40%), and the research proposal (20%). Late research proposals will be marked down 10% of your score for each late day (including weekends)

Attendance: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructors of this section, we will not take attendance but please note that any material covered in lecture is fair ground to be on exams, even if such material is not available in lecture notes.

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 9 hours per week (3 hours per unit) of their own time in course-related activities, including reading. Reading will involve literature available on the Internet.

Other Important University Policies:

Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate/graduate catalog.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period 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. 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. **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. For more information, contact the Office of Financial Aid and Scholarships (<http://wweb.uta.edu/ses/fao>).

Disability Accommodations: UT 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)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. 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 disability. Students are responsible for providing the instructor with official notification in the form of a **letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: 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.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

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.

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>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a 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>.

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 syllabus*. 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. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

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 down the stairs either (1) to the left of the door and through the double doors, or (2) to the right of the door and around the right corner at the hall intersection. 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.

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 <http://www.uta.edu/universitycollege/resources/index.php>.

The IDEAS Center (2nd Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

The English Writing Center (411LIBR): The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at <http://uta.mywconline.com>. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <http://library.uta.edu/academic-plaza>

Below is a *TENTATIVE* schedule of topics for the duration of the course that is likely to change depending on student outcomes, the pace of lectures and topics, and to meet the best interests of students (at the discretion of the course instructors).

Lecture	Date	Day	Topic	Professor
1	1/17/17	Tuesday	Introduction	Fujita
2	1/19/17	Thursday		Fujita
3	1/24/17	Tuesday	Databases	Fujita
4	1/26/17	Thursday		Fujita
5	1/31/17	Tuesday	Genetic Variation	Fujita
6	2/2/17	Thursday		Fujita
7	2/7/17	Tuesday	Recombination	Fujita
8	2/9/17	Thursday		Fujita
9	2/14/17	Tuesday	Natural Selection	Fujita
10	2/16/17	Thursday		Fujita
11	2/21/17	Tuesday	Phylogenomics	Fujita
12	2/23/17	Thursday		Fujita
13	2/28/17	Tuesday	Human Evolution	Fujita
14	3/2/17	Thursday		Fujita
15	3/7/17	Tuesday	Evolution of Sex	Fujita
16	3/9/17	Thursday	Genome Sequencing Technologies	Castoe
	3/14/17	Tuesday	Spring Break	
	3/16/17	Thursday	Spring Break	
17	3/21/17	Tuesday	Genome sequencing and assembly	Castoe
18	3/23/17	Thursday		Castoe
19	3/28/17	Tuesday	Next-generation sequencing - Methods & Exp. Design	Castoe
20	3/30/17	Thursday		Castoe
21	4/4/17	Tuesday	Next-generation sequencing - Methods & Exp. Design	Castoe
22	4/6/17	Thursday		Castoe
23	4/11/17	Tuesday	Genome size variation	Castoe
24	4/13/17	Thursday		Castoe
25	4/18/17	Tuesday	Repetitive elements	Castoe
26	4/20/17	Thursday	Evolution and Impacts of repetitive elements	Castoe
27	4/25/17	Tuesday	Central Dogma, ncRNAs and Proteomics	Castoe
28	4/27/17	Thursday	Epigenetic and Genomic Imprinting	Castoe
29	5/2/17	Tuesday	Comparative genomics	Castoe
30	5/4/17	Thursday	Personalized genomics, GWAS, Rare Variants	Castoe

As the instructors for this course, we reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Dr. Matthew K. Fujita & Dr. Todd Castoe