Genomic Biology 3403/5403, 3 credits
Instructor: David Liberles
Office: BioLife 113A
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Office hours with the instructor are by prior request through email.

Course Tutor: Rebecca Kaufman
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Office hours with the course tutor will be announced after the beginning of class and a survey of student available times. In addition to regular office hours for one on one meetings, the tutor will also hold scheduled tutorial sessions.

Tutorial Sessions: Times for tutorial sessions will also be announced. There will be one tutorial session per week to review lecture material and to review in advance of the quiz, the midterm, and the final. Additionally, the weekly tutorial sessions will be used to orient students on their course projects and the use of software needed to test hypotheses.

Course Meetings: TTh 5:30-6:50 in BioLife133

Course Goals: This course will cover the process of gene inheritance and descriptions of genome structure, as well as a discussion of gene content and function across lineages. Students will learn about genome-related technologies, including genome sequencing. They will also learn about how genomes vary across species, as well as the forces driving these evolutionary changes. Students will complete quizzes and exams to demonstrate understanding of the information present in genomes and the processes that drove it.

Lecture Topics
1. Inheritance and DNA
2. Genome Sequencing Technologies and Genome Assembly
3. Genome Annotation and Functional Annotation
4. A history of life on Earth that genomes evolved in
5. Qualitative discussion of the neutral theory and how genomes evolved
6. Viral Genomes
7. Bacterial and Archaeal Genomes (and Metagenomic Analysis)
8. Eukaryotic Chromosomes
9. Ciliates and Genome Rearrangement
10. Fungal Genomes
11. Other Eukaryotic Genomes
12. Whole Genome Duplication: The Examples of Plants and Fish
13. The Human Genome
14. Gene and Genome Databases
15. ENCODE and genome function: A case study in controversy
16. Transcriptomic and Proteomic Data
17. Metabolomics and other Omics
18. The genetics and genomics of human disease
19. Cancer genomics
20. Tasmanian Devil Facial Tumor Genomics and Transmissible Cancer
Exams/Grading

1. Quiz 20% September 13, 2018
2. Mid-Term 40% to be announced
3. Final Exam 40% (finals week)

4. Students registered for 5403 will have an additional hands on assignment that they will work on during the semester that is worth 25% of the grade, with the above items re-normalized to 75% of the grade. This will be announced early during the class. Part of the grade will be assigned for (i) generation of the hypothesis and (ii) preliminary data generation during the semester, in addition to (iii) the final project report.

Quizzes and exams will be strictly graded, but final course grades will be based upon separate curves for 3403 and 5403 based upon natural breaks in the score distribution. Course attendance is not mandatory, but students will be responsible for knowledge provided during missed classes.

Course Text: Bioinformatics and Functional Genomics 3rd Edition, by Jonathan Pevsner (Wiley-Blackwell). **Note:** The course textbook will not be followed particularly closely, but is still useful to have as a reference material.

Reading Materials will include primary literature readings indicated on blackboard, as well as readings from the class indicated on the lecture notes.

Required Disability Statement: Any student who has a need for accommodation based on the impact of a documented disability, including special accommodations for access to technology resources and electronic instructional materials required for the course, should contact me privately to discuss the specific situation by the end of the second week of classes or as soon as practical. If you have not done so already, please contact Disability Resources and Services (DRS) at 215-204-1280 in 100 Ritter Annex to learn more about the resources available to you. We will work with DRS to coordinate reasonable accommodations for all students with documented disabilities.

Required Statement on Student and Faculty Academic Rights and Responsibilities: Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed through the following link: [http://policies.temple.edu/getdoc.asp?policy_no=03.70.02](http://policies.temple.edu/getdoc.asp?policy_no=03.70.02).

Link to Temple Technology Usage Policy: [https://computerservices.temple.edu/technology-usage-policy](https://computerservices.temple.edu/technology-usage-policy)