

Genetics (BIOL 3416) - Spring 2019

Synopsis	An overview of the principles of genetics including classical Mendelian inheritance and basic concepts in modern molecular genetics in eukaryotic and prokaryotic organisms.
Meeting Times and Place	TR 3:30 m - 4:50 in Chemistry 049. You are expected to attend all class meetings. Failure to attend will be detrimental to your grade.
Professor	Dr. David A Ray, ESB 206, 806-834-1677, david.a.ray@ttu.edu Office hours: T, 9-10 (ESB 201), Th 10-11 (ESB 201), others by appt.
Learning Objectives and Assessment	By the end of this course, students should: Understand basic concepts and problem solving in genetics, discuss patterns and mechanisms of inheritance and gene expression, and describe concepts related to evolution and population genetics. Learning outcomes will be assessed using laboratory exercises, essays, and in-class exams.
Required Text	Genetic Analysis: An Integrated Approach, 3 rd Edition by Sanders and Bowman
Course Format	Each class will be a combination of various techniques designed to engage students in meaningful discussion and increased understanding of the topics. The main section will consist of lectures, listening assignments, and some discussion. The laboratory will consist of additional discussion, problem solving, laboratory exercises, and writing on current events and popular culture depictions of genetics.
Exams	Exams. Students will have three exams during the regular semester and a final exam at the end of the class. Because of the large size of the class, each exam will consist of multiple choice questions. Make-up exams will be allowed only under extraordinary circumstances and will be of a different format and have different questions from the regularly scheduled exam. Students who miss an exam without a valid excuse will receive a ZERO for that exam.
Grading	A (90-100%), B (80-89%), C (70-79%), D (60-69%), F ($\leq 60\%$) Grades are based on the following weighting scheme, with a total of 650 points available: Exams – Three mid-term exams (100 pts each), one cumulative final exam (150 pts) Laboratory exercise write-ups – 40 pts total Laboratory quizzes – 120 pts total Laboratory current events essays (x2)– 40 pts total
Evacuation Plan	In the event of an emergency, leave the classroom in an orderly manner. Leave the building through the nearest outside door and quickly move as far away as possible. Do not gather near building or parking lots.
Religious Holidays	Students who intend to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent for the observance of a religious holy day shall be allowed to take an exam or complete an assignment scheduled for that day within a reasonable time after the absence.
Honor Statement	Dishonesty on tests, quizzes, written work, or connected with your attendance in lab or lecture will have serious consequences. Students are expected to be aware of, and abide by, the University's Honor code. Plagiarism on written lab reports or essays (copying/paraphrasing from other students or from other sources without giving due credit) will result in the loss of all points for that exercise, at the very least.
ADA Statement	Any student who, because of a disability, may require special arrangements to meet the course requirements should contact the instructor as possible to make necessary arrangements. Students must present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services office in 335 West Hall or call 806-742-2405.

<p>Lecture Topics/Schedule</p>	<p>I will try to adhere to this as much as possible but there may be deviations as the semester progresses, simply due to in-class discussion or other complications.</p> <p>1/17 – Introduction and Mendelian Genetics (Intro and Chapter 2) 1/22 – Mendelian Genetics (Chapter 2) 1/24 – Mendelian Genetics and Chi-square analysis (Chapter 2) 1/29 – Mendelian Genetics and Chi-square analysis (Chapter 2) 1/31 – Chromosomal Inheritance and Cell Division (Chapter 3) 2/5 – Gene Interactions (Chapter 4) 2/7 – Gene Interactions (Chapter 4) 2/12 – Linkage and Mapping (Chapter 5) 2/11 – Exam 1, Biology LH 100, 7 pm – 9 pm 2/14 – Linkage and Mapping (Chapter 5) 2/19 – DNA structure and Replication (Chapter 7) 2/21 – DNA structure and Replication (Chapter 7) 2/26 – Transcription (Chapter 8) 2/28 – Transcription (Chapter 8) 3/5 – Translation (Chapter 9) 3/7 – Translation (Chapter 9) 3/12 – 3/14 – Spring Break, no classes 3/19 – Cytogenetics (Chapter 10) 3/19 – Exam 2, Biology LH 100, 7 pm – 9 pm 3/21 – Mutation, Repair, Recombination (Chapter 11) 3/25 – Mutation, Repair, Recombination (Chapter 11) 3/27 – Bacterial Gene Regulation (Chapter 12) 4/2 – Bacterial Gene Regulation (Chapter 12) 4/4 – Eukaryotic Gene Regulation (Chapter 13) 4/9 – Eukaryotic Gene Regulation (Chapter 13) 4/11 – Genetic Engineering (Chapter 15) 4/16 – Genomics (Chapter 16) 4/18 – Genomics (Chapter 16) 4/23 – Exam 3, Biology LH 100, 7 pm – 9 pm 4/25 – Population Genetics and Evolution (Chapter 20) 4/30 – Population Genetics and Evolution (Chapter 20) 5/2 – Human Evolutionary Genetics (Application D) 5/7 – Quantitative Trait Analysis (Chapter 19) 5/10 – Final exam, 4:30 – 7 pm</p>
<p>Laboratory</p>	<p>Dr. Chris Rock is the coordinator for all genetics laboratory experiments. Questions about those experiments should be addressed to his office (806-834-4803, chris.rock@ttu.edu). The laboratory will also consist of problems assigned from your textbook and in class. The writing emphasis for the class is evaluated as part of the laboratory. This will consist of two essays on current events related to genetics. Specific instructions will be provided by your TAs. There will be a quiz at each laboratory meeting.</p>
<p>Laboratory TAs</p>	<p>Balasubramaniam, Thuvaraki - 742-5070; thuvaraki.balasubramaniam@ttu.edu Cai, Yifan - 742-5070; yifan.cai@ttu.edu Sharma, Rajat - 742-5070; rajat.sharma@ttu.edu Fumagalli, Sarah - sarah.e.fumagalli@ttu.edu</p>

<p>Laboratory Topics/Schedule</p>	<p>Week of: Topics 1/21 – 1/25: Chapter 1 exercises; Drosophila mapping experiments 1/28 – 2/1: Chapter 2 exercises and discussion; Human karyotype analysis 2/4 – 2/8: Chapter 2 exercises; Drosophila mapping experiments 2/11 – 2/15: Chapter 3 & 4 exercises 2/18 – 2/22: Chapter 5 exercises; Drosophila mapping experiments 2/25 – 3/1: Chapter 6 exercises and discussion 3/4 – 3/8: Chapter 7 exercises; PCR transcript mapping exercise; first current events essay due 3/11 – 3/15: Spring Break 3/18 – 3/22: Chapter 8 exercises and discussion 3/25 – 3/29: Chapter 9 exercises and discussion 4/1 – 4/5: Chapter 10 & 11 exercises and discussion 4/8 – 4/12: Chapter 12 & 13 exercises and discussion 4/15 – 4/19: Chapter 16 exercises and discussion; second current events essay due 4/22 – 4/26: Chapter 20 exercises and discussion; Human trait analysis 4/29 – 5/3: Chapter 20 exercises and discussion; Human trait analysis</p>
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