

**Genetics Biology 2296
Spring 2017**

<u>Lecture Times</u>	M, W, F 12:00-12:50pm
<u>Class Location</u>	Anderson Hall 17
<u>Course Coordinator</u>	Dr. Darius Balciunas
<u>Lab Coordinator</u>	Dr. Jennifer Emtage
<u>Instructors:</u> Dr. Darius Balciunas (lectures) Dr. Jennifer Emtage (lectures and lab)	Bio-Life Sciences Room 435 Biology Department bio2296@temple.edu 215-204-1611 Bio-Life Sciences Room 248A Biology Department jemtage@temple.edu 215-204-8870
<u>Office hours</u>	tbd

Course Description

Genetics, the science of heredity, is the cornerstone of modern biology. Understanding of genetics is central for many biological disciplines as different as medicine, evolution and conservation biology.

Biology 2296 is the first introductory course in Genetics. The major focus of the course will be the information presented in the lectures and applied in the laboratory. It is crucial that you do not fall behind in this course. Review each lecture to ensure that you understand the material. Each piece of new information is built on evidence and information from previous material. You have to understand the background to see why experiments were performed and interpret the significance of the results.

This course is writing-intensive. You will be expected to write lab reports presenting the results and interpretation of laboratory experiments that you perform during the course.

The textbook, the electronic handouts, and the questions in the laboratory are to help you understand the information presented in the lectures. Open office hours are offered to help you understand challenging genetic concepts so you would be able to apply them in solving genetics problems. Memorization without understanding invariably results in poor test scores. Lecture attendance is very important for your success in the course, as we have found that students who failed or did poorly are most often those students who did not attend the lectures.

Course materials

Lecture: Required:
Genetics. From Genes to Genomes, 5th edition (2014). Hartwell L. H., Hood, L., et al., published by McGraw-Hill Companies (ISBN: 9781259897993 for the “regular” book or ISBN: 9780077515041 for the e-book with loose-leaf option, through <http://connect.mheducation.com/class/t-genetics-spring-2017>). These editions should include a Connect Plus access card, which gives you access to the Solutions Manual (see below). Older editions would be fine for most of the class. If you use an older edition, it is your responsibility to match chapter / figure / problem numbers.

Strongly recommended:
Study Guide/Solutions Manual to Accompany Genetics: From Genes to Genomes 5th edition (2014), prepared by D. Nero, McGraw-Hill Companies. Electronic access included with Connect Plus (see above).

Students will need access to Blackboard (Bb) through the TU Portal. Log on to TU Portal using your Temple University user ID and password. Students enrolled in Bio 2296 are automatically enrolled in the course web site. If you are having difficulty accessing the web site: (1) confirm that you are registered for the course, and (2) contact Computer Services to verify your user ID and password. Lecture material will be uploaded to Bb before being presented in class and students are responsible for acquiring the handouts from the Bb site.

Laboratory: *Genetics Lab Manual (Bio 2296)* (Purchase at Ritter Hall, room 234)
Experimental Research Notebook: must have duplicate pages.

Email correspondence

All correspondence regarding lectures, exams or other class related issues should be addressed to course coordinators by emailing to bio2296@temple.edu. While composing an email, in the subject line, please, write “*your first name, your last name*”. Your message should be clear and succinct. Emails to lecturers’ personal email accounts will NOT be answered.

Lab related questions should be addressed to your lab instructor or the lab coordinator, Dr. Emtage.

Grading components

There are seven components that will determine your final grade for the course.

Intro quiz	10 extra points for completion, <i>regardless of score</i>
Midterm exam I	100 points
Midterm exam II	100 points
Midterm exam III	100 points
Final Exam	100 points
<u>Laboratory grade</u>	<u>100 points</u>
Total:	500 (+10) points

Laboratory grade

(1) Laboratory reports [37 points]; (2) In class writing exercises [20 points]; (3) Other Lab Exercises [16 points]; (4) Quizzes [20 points]; (5) Pre-lab Notebooks [7 points]. Laboratory regulations and information regarding lab notebooks, lab reports, safety rules, and the rules for *Drosophila* experiments will be covered during the first lab session. It is important that you realize that laboratories may be dangerous and that you must be responsible for careful handling of equipment, supplies, microscopes, and experimental material.

Laboratory reports comprise the writing – intensive aspect of the course. The reports should be in a format simplified from that of the research papers which scientists use to publish their findings. They should be well organized, and clearly and concisely written. You should be able to present your data effectively and accurately interpret what your results mean. The report should demonstrate that you understand what questions your experiments answered, and why each step of the procedure was useful. You should clearly cite any outside sources you used to write your report.

If you have questions about any of the laboratory rules, procedures and requirements, your laboratory instructor or Dr. Jennifer Emtage will be available to help you.

Final letter grading

Students can expect letter grades based on the following point percentages (out of 500 maximum points).

Point %	93-100	90-92	87-89	83-86	80-82	75-79	70-74	65-69	58-64	<58
Letter grade	A	A-	B+	B	B-	C+	C	C-	D	F

Please note: total scores that appear on Blackboard grade center DO NOT reflect your actual total score. We will use Blackboard grade center to post RAW scores only. After each exam we will announce preliminary point margins for letter grades.

Lectures

Due to time limitations lectures are intended to cover only the material that is most important or most difficult. It is your responsibility to study covered chapters in full. Lab quizzes and exams will contain questions from material not covered in lectures.

Examinations

Regular exams will consist of multiple choice questions. There will be two one-hour midterm examinations and a two-hour final examination (see schedule). Half of the final exam will cover material from the last third of the course while the other half will be cumulative. Exam questions will be drawn from lecture material and from laboratory exercises.

Make up exams

If you miss class on the day of an exam, you must:

- (1) have a documented justifiable excuse (justifiability will be determined)
- (2) notify the instructors by emailing to bio2296@temple.edu **PRIOR** to the absence.

The date of the make-up exam will be scheduled by the instructors within one week from the date of the original exam. To avoid scheduling conflicts, make up exams will be scheduled for 7:00 AM. Only one opportunity will be provided. Any student who fails to follow these procedures will be assigned a grade of 0 (zero) for the missed exam. Please keep in mind that make-up exams are significantly more challenging than regular exams.

Challenges to exam grading

Mid-term examinations will be returned to you in the lecture. If you think that your answer is correct but was graded as incorrect, you should compose a written explanation justifying your answer based on reliable scientific evidence. Your written explanations should be emailed to the lecturers (bio2296@temple.edu) within 1 week after exams are returned. Late challenges will not be accepted. In the past, challenges have been awarded no credit, half credit or (rarely) full credit. Due to time constraints, this procedure cannot be applied to the final exam.

Open office hours

Office Hours will follow an open question and answer style format, where students will have the opportunity to address questions directly to the lecturers related to Genetics course material covered in class.

Individual appointments:

In case a student would like to meet the lecturers to discuss individual matters, requests for appointments should to be emailed to bio2296@temple.edu. In your email for the appointment, please provide several times that you are available, and we will try to accommodate your request in a timely manner. Due to class size, we may only be able to schedule **one individual meeting per student per semester**.

Attendance

Attendance at lectures, though voluntary, is important because information discussed in the lecture will be emphasized in the exams. Attendance in laboratories is mandatory and will be recorded. Excused

absences will be determined based upon on documented illness, emergency, or civic responsibility (e.g., jury duty).

Withdrawal from the class

Last day to drop a course (Monday, January 30) and to withdraw from class (Wednesday, March 22) are posted on the Academic Calendar on Temple's website. Students are responsible to determine their eligibility to withdraw from class, if you have questions check with the Biology Department.

Cheating

Any student who is caught cheating is in violation of the Temple University Student code and will receive an F for the course. Plagiarism in lab reports will not be tolerated and will result in ZERO points without a possibility to rewrite.

Disability Statement

Temple University is committed to the inclusion of students with disabilities and provides accessible instruction, including accessible technology and instructional materials. The process for requesting access and accommodations for this course is:

- (1) Advise instructors of the need for access or accommodations
- (2) Contact Disability Resources and Services (DRS) to request accommodations
- (3) Present DRS accommodation letter.

Preliminary class schedule			
Month	Day	Chapters	Topics
Jan	18	Chapter 2	Introduction. Mendel's law of segregation. Testcross
	20	Chapter 2	Basic rules of probability. Mendel's law of independent assortment
	23	Chapter 2	Application of Mendel's laws to humans
	25	Chapter 3	Extensions to Mendel for single gene inheritance
	27	Chapter 3	Extensions to Mendel for multifactorial inheritance
	30	Chapter 4	Chromosome structure and mitosis
Feb	1	Chapter 4	Meiosis
	3	Chapter 4	Chromosome theory of inheritance
	6	Chapter 5	Gene Linkage and recombination
	8	Chapter 5	Gene mapping
	10	Chapter 5	Mitotic recombination
	13	Chapter 5	Problem solving
	15	Chapter 6	DNA structure and replication
	17		Review for Exam I (Chapters 1-5)
	20	EXAM I	Chapters 1-5
	22	Chapter 6	DNA recombination
	24	Chapter 7	Mutations, genes, biochemical pathways
	27	Chapter 7	Mutations, genes, biochemical pathways
Mar	1	Chapter 8	The genetic code, transcription, translation
	3	Chapter 8	Gene expression: prokaryotes/eukaryotes, effects of mutations
	6	Chapter 9	Genetic methods: fragmenting and cloning the DNA
	8	Chapter 9	Analyzing genomes: Variation between genomes, PCR, sequencing
	10	Chapter 10	Detection of DNA polymorphisms
	13		
	15		SPRING BREAK!
	17		
	20	Chapter 10	Complex genetic analysis: identification of causative mutations
	22	Chapter 10	Complex genetic analysis: identification of causative mutations
	24		Review for exam II (Chapters 6-10)
	27	EXAM II	Chapters 6-10
	29	Chapter 11	The eukaryotic chromosome: packaging and managing DNA
	31	Chapter 12	Chromosomal abnormalities: number and rearrangements
Apr	3	Chapter 12	Transposons and transposition
	5	Chapter 13	Bacterial genetics
	7	Chapter 15	Gene regulation in prokaryotes
	10	Chapter 16	Gene regulation in eukaryotes
	12	Chapter 16	Gene regulation in eukaryotes: chromatin condensation, imprinting
	14	Chapter 16	Post-transcriptional mechanisms
	17	Chapter 17	Manipulation of eukaryotic genomes and gene therapy
	19	Chapter 19	Genetics of cancer, personalized cancer treatment
	21	Chapter 20	Variation and Selection in populations
	24		Extra lecture (Chapters 11, 12, 13, 15, 16, 17, 19, 20)
	26		Extra lecture or review (Midterm 3)

	28	EXAM III	Chapters 11-20 (note: only material covered/specified in lectures)
May	1		Final Review
	8	FINAL EXAM 10:30-12:30	Includes <u>all</u> material from Midterms I-III
	<p>Note that some sections of other courses have final exams scheduled on the same day: www.temple.edu/registrar/documents/downloads/Spring_2017_EXAMS.pdf We recommend signing up for a different section in these courses if possible. This is the only date / time for Genetics 2296 final exam.</p>		