

Genetics
PCB 3063-001 (4 credits)
Spring 2017 (10967)
TR 2:00-3:50PM in NU 113

Instructor:

Dr. David Binninger

Required Textbook

Genetics: A Conceptual Approach (Fifth Edition -2014) by Benjamin Pierce

Office Hours —

Wednesday and Thursday from 12:00-1:30 PM

All other times by appointment.

****e-mail is the most effective way of reaching me —***

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Phone — (561) 297-3323

Written communications can be slid under my office door – Room 210 in Sanson Science. This will be more effective than putting the material in my departmental mailbox.

Course Description:

An in-depth analysis of the mechanisms that operate in transmission genetics and an introduction to eukaryotic molecular genetics including regulation of gene expression, genomics, epigenetics and bioinformatics.

Prerequisites:

Bio-principles lecture (BSC 1010)

General Chemistry 1 (CHM 2045)

Course objectives

Students should be able to do the following after completion of this course:

- Understand that the basic unit of heredity is the gene.
- Discuss how different forms (alleles) of genes lead to variation among members of a species.
- Have insight into how genes determine phenotypes along with a conceptual understanding of the molecular aspects of how DNA, RNA, and proteins contribute to gene expression.
- Have familiarity with some landmark experiments of Mendel, Morgan, Bridges, McClintock, Watson, Crick, and other investigators whose work profoundly affected our understanding of heredity.
- Appreciate the connection between chromosome behaviors during meiosis and the basic Mendelian principles of heredity.
- Articulate how the fundamental biological tenet of evolution can be explained in genetic terms.
- Understand how genetic mutations alter genes that are then acted upon by natural selection.
- Draw interconnections between genetics and the other major disciplines of biology, including cell biology, development, physiology, taxonomy, ecology, biochemistry, and evolution.

Blackboard

Blackboard will be used for e-mail communications, posting changes in the course syllabus and grades, downloading lecture notes and podcasts as well as other items of interest.

Lecture Notes

The slides for the fall 2015 lectures can be downloaded **in advance** from Blackboard. These lecture notes are provided in both a PowerPoint and PDF formats. The PDF version prints three slides per page along with space for notes. These should be useful in class for taking notes. You will need Adobe Acrobat Reader or equivalent software to open and print these files. After each lecture, the PowerPoint and PDF files from 2015 will be replaced with the 2016 lecture slides.

Course Requirements

Attendance does not affect your grade. You do not lose points for not coming to class and your grade cannot be improved by coming to class.

Your final grade will be based on your average of four examinations.

The examinations will be ~ 45-50 multiple-choice questions only.

Exam grades are “normalized” based on the performance of the class overall and expectations based on the performance of students from previous classes.

Make-up exams will only be considered for truly exceptional and unexpected circumstances.

There will be an optional cumulative Final Exam that you may take to improve your grade. The Final Exam grade can be used to fully replace your lowest regular exam score or substitute for a missing exam. If your Final Exam score does not improve your grade, it will be ignored.

Course Average	Grade
≥93	A
90-92	A-
89 - 87	B+
86 - 83	B
82 - 80	B-
79 - 77	C+
76 - 73	C
72 - 65	C-
60 - 64	D+
59 - 55	D
54 - 50	D-
≤49	F

The results will be posted on Blackboard as soon as they are available. It takes up to 24 hours to obtain the results from the testing office.

Grades will be posted by a confidential 4-digit PIN. **Grades are NOT posted in the Blackboard grade book.** Grades are posted in ranked order on a PDF file that can be downloaded from Blackboard.

Exams

You must show a photo ID when you turn in your exam!

Please bring a blue Scantron answer form, two sharpened #2 pencils and a photo ID to the exam. All electronics must be securely out of sight. This includes, but is not limited to, iPods, calculators, cell phones, tablets, etc.

If I or proctors see you with an electronic device, I will assume you were using it to cheat! At a minimum, I will give you a zero for the exam.

Exam Schedule

	Exam Date	Last day to review the exam
Exam 1	February 6 th	February 10th
Exam 2	March 6 th	March 9th
Exam 3	March 27 th	March 30th
Exam 4	April 3 rd	April 6 th
Final Exam (optional)	May 1 st .	

Video Podcasts

I will attempt to create a video podcast of each lecture. The technology is not perfect so do not assume that a video podcast will always be available. The video podcast can be downloaded as a movie that plays in QuickTime or iTunes for Mac or Windows.

TopHat

We will be using TopHat instead of iClicker for in-class responses to questions during the lecture. Your responses will be counted as Extra Credit and will not be used for attendance. As noted above, attendance does not affect your course grade. You will use your laptop, tablet or smart phone, so there is no hardware to purchase. However, there is a modest fee, but your participation is optional.

A portion of the Extra Credit will be awarded for simply participating. However, you must respond to all questions during the lecture to receive the participation points. Additional credit will be given for correct answers.

The maximum Extra Credit associated with use of iClicker will be 10 points (equivalent to a full letter grade) added to your final course score.

Additional information on how to register for TopHat and information on how to use the software and technical support will be provided separately.

Accommodations for Students with Disabilities.

In compliance with the Americans with Disabilities Act (ADA), students who require reasonable accommodations due to a disability to properly execute coursework must register with the Office of Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses- Boca Raton, Davie, and Jupiter, however, disability services are available for students on all campuses.

Honor Code

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information,

see <http://www.fau.edu/ctl/4.001> Code of Academic Integrity.pdf

Religious Accommodations:

Students who wish to be excused from coursework, class activities or examinations must notify the instructor in advance of their intention to participate in religious observation and request an excused absence.

Out of Class Assignments

Prior to each lecture, read the corresponding chapter from the textbook (see course schedule below). It is recommended that you also review the lecture slides and a podcast from last year that are available on Blackboard. Thus, you can preview the material to be covered in class; each slide should not be a surprise.

Attendance Policy:

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Note: Adjustments to the syllabus may be needed as we progress through the course

Date	Topic	Reading
Week 1	Introduction to Genetics	Chap 1
	Chromosomes and Cellular Reproduction	Chap 2
Week 2	Basic Principles of Heredity	Chap 3
	Sex Determination and Sex-Linked Characteristics	Chap 4
Week 3	Extensions and Modifications of Basic Principles	Chap 5
	Pedigree Analysis, Applications and Genetic Testing	Chap 6
Week 4	Linkage, Recombination and Eukaryotic Gene Mapping	Chap 7
	Catch Up and Questions	
Week 5	Exam 1 (Chapters 1-5)	
	Chromosome Variation	Chap 8
Week 6	Bacterial and Viral Genetic Systems	Chap 9
	DNA: The Chemical Nature of the Gene	Chap 10
Week 7	Chromosome Structure and Organelle DNA	Chap 11
	Catch-Up and Questions	
Week 8	Spring Break	
Week 9	Exam 2 (Chapters 6-10)	
	DNA Replication and Recombination	Chap 12
Week 10	Transcription	Chap 13
	RNA Molecules and RNA Processing	Chap 14
Week 11	The Genetic Code and Translation	Chap 15
	Control of Gene Expression	Chap 16 & 17
Week 12	Catch-Up and Questions	
	Exam 3 (Chapters 11-16)	
Week 13	Gene Mutations and DNA Repair	Chap 18
	Molecular Genetic Analysis and Biotechnology	Chap 19
Week 14	Genomics and Proteomics	Chap 20
4-7-2017	Last Day to Withdraw	
Week 15	Epigenetics	Chapter 21
	Developmental Genetics, Immunogenetics and Cancer Genetics	Chapter 22 & 23
Week 16	Catch-Up and Questions	
	Exam 4 (Chapters 17-21; selected parts of 22-23)	
4-25 & 4-26	Reading Days	
4-27 & 5-3	OPTIONAL Final Exam – starts at 1:15PM	