

BIO s325 – GENETICS
Summer 2011 – Second Session
Prof: Janice Fischer

MTWThF
10:00–11:30am
RLM 6.104

COURSE INFORMATION AND POLICIES

REQUIRED BOOKS

1. *Genetics: From Genes to Genomes – 4rd edition* by Hartwell et al. (McGraw-Hill publishers) If you buy this book, you will have on-line access to the web supplement: “*Genetic Portrait Chapters*”. There will reading assigned from this supplement as well. You will also have access to a variety of animations and study aids on the website associated with the book. You might find these useful.

There is also an ebook available for purchase at a lower cost if you prefer.

2. *Solutions Manual* for problems in Hartwell textbook (authored by Nero).

LECTURES

This course will consist of a series of lectures covering a broad range of topics in GENETICS. Lectures will be based mainly on material in the textbook. However, some information is not in the book. When this occurs, supplementary reading will be posted on Blackboard.

My job in lecture:

- (1) My lectures are designed to let you know which material is important for you to understand and study. The exams will cover only the material that I cover in class.
- (2) My aim in lecture is to present the material in a manner that helps you to understand it better and more quickly than if you only read the textbook on your own.
- (3) I aim to put the material in perspective so that you can see why it is useful to know these things.

Your job in lecture:

1. **You are expected to show up every day.**
2. **You are expected to be prepared. You should do the assigned reading before you come to class. That way, you will be able to follow the lecture and be able to ask questions.**

BLACKBOARD

I will use the Blackboard website for this course to post the following:

- (1) Powerpoints of my lectures. These will be posted by the night before the lecture.
- (2) Supplementary reading or other material
- (3) List of relevant practice problems in textbook
- (4) Detailed answers to the Exams and exam grad statistics
- (5) Important Announcements

Make sure that your email address on Blackboard is accurate as I may email the class with important announcements

HOMWORK AND STUDYING

Learning GENETICS is like learning to play a musical instrument or learning to excel in a sport that requires eye-hand coordination. You need to practice a lot in order to synthesize and solidify new neural circuits in your brain. Your brain needs to rewire itself physically in order for you to think abstractly like a geneticist. Yes, really. Think of me the way you think about your music teacher or your athletic coach. In lecture, I can explain to you what it is you need to practice thinking and why, but I cannot do the thinking practice for you. You must do it yourself, and as much as possible. **MEMORIZING, OR TRYING TO STUDY SPECIFICALLY TO PASS AN EXAM, WILL GET YOU NOWHERE IN THIS COURSE.** So please, for your own sake, stop thinking about school that way.

You have to keep up with the class every day and every weekend because the summer course is relentless and goes by quickly! The comprehensive final is the day after the last lecture!!! Summer session is "total immersion" Genetics. Here is a guide for how to keep up:

You have several homework assignments every single day.

1. Make sure that you understand what happened in class that day. Re-read the material for the lecture you just heard, and identify questions to bring to Discussion Section or Office Hours.
2. Read the book chapter(s) for the next day's lecture.
3. At the end of each chapter, there are excellent problems to solve, and solving them will help you to understand lecture. A list of the problems at the end of each chapter relevant to the course material is posted on Blackboard. The more of those you do and think about – the more you will learn in this class. You have the answers to all of them, with explanations, in the solutions manual.
4. You are registered for a Discussion Section twice weekly and I have an office hour every single afternoon (see below). If there is something you don't understand, don't let it go! Get your questions answered promptly.

Do not feel constrained in your learning by your textbook or the supplementary reading that I post. That would be crazy! I think that the textbook is very good, but you have the whole world in your hands at the keyboard of a computer. Don't hesitate to use the internet to find additional helpful reading material. However, as always, **DO NOT TRUST THE ACCURACY OF EVERYTHING** you read on the internet. If anything you read seems at odds with the way we discussed something in class, please tell me or your TA about it in discussion section. This could spark interesting discussion. Also, when we talk about molecular biology techniques and experiments, you might want to look for demonstrations of these techniques on YouTube. Yes – YouTube!!! There are videos of people performing various laboratory techniques, and seeing this can sometimes help you understand the laboratory procedures that you have not yourself done or witnessed.

The University Course Guidelines suggest that for each hour a course meets, an average of 2 additional hours of studying is expected of the student. Therefore, taking this course over the summer is obviously a 20-hour per week job. The course material is highly analytical and draws from a broad knowledge base. Thus, it will require a lot of time.

DISCUSSION SESSIONS

There will be 4 discussion sessions per week, the times of which are listed below. The purpose of the discussion sections is for you to avail yourselves of your TA, who will be there prepared to answer any questions you might have about the lecture material or homework problems. The discussion sessions are your opportunity to meet with your TA and ask questions about lecture material or about the practice problems in the book. Provided that there are enough seats in the room, you may attend as many discussion sessions as you like and as your schedule allows. **The expectation is that you are available for at least two of these sessions per week as this is what you agreed to when you signed up for this class. Please remember that the TA is not your personal 24/7 tutor, and that you have to show up prepared at Discussion Session to get the help that you need. Please also remember that NOTHING MAGICAL is going to happen in discussion session.** By this I mean that merely attending discussion sections is NOT a substitute for your own personal studying, and the TA is not responsible for your learning the material or for your grade. Taking personal responsibility to work hard on your own, and bringing your questions and difficulties to discussion session is the only way to do well in this class. Your TA will provide you with more information about how he plans to run discussion sessions.

Discussion Session Schedule:

TuTh	1:00pm–2:00pm	RLM 6.116
TuTh	2:00pm–3:00pm	RLM 6.116

EXAMS

There will be three exams in the course: two mid-terms and a final. The mid-term exams are during class (see schedule), and the final is scheduled by UT during Final Exam week (see date and time on schedule below). The final exam will be comprehensive. The two mid-term exams will consist of short-answer questions and problems. The final exam will be multiple choice.

Look at the dates and times of all three exams in order to be certain that you are able to attend. The University allows me to give make-up exams only for officially sanctioned reasons such as documented serious illness, etc. I am not allowed to give make-up exams for any planned absences, such as weddings, family vacations, or anything of that nature.

GRADES

Your final course grade will be computed as follows:

- 30% midterm exam #1
- 30% midterm exam #2
- 40% final exam

The average on exams is usually 75%, and the class grades are usually curved so that the numerical average of all four exams is the lowest B-. Information regarding the grade-spread of the class as a whole will be available after each exam. This is meant to give you a rough idea of what your numerical score means. I will not assign letter grades to each exam. At the end of the class, your numerical average will be used as the basis for your letter grade. I will assign grades using the +/- system.

It is impossible to predict your final grade until the course is over because I do not use mathematical formulas to assign the cut-offs for different grades. That means that there is no quota grade assignments - there are not a set number of As, Bs, Cs, etc. and nobody has to fail the class. I use my judgment to do this at the end of the class. For example, the system described above is based on the expectation that the class average on exams is about 75% - which is what I expect. Using my judgment instead of mathematical formulas and thus quotas means that if the whole class gets above 90% on every exam, everybody gets an A.

Keep in mind that your classmates who are not doing well inevitably drop the course along the way, so the class average inevitably goes way up by the end of the class relative to what it was at the start. This means that if your first exam grade was average, it will almost certainly be below average when I calculate the grades at the end of the class.

Exams will be graded by me (JF). If you ever feel that a mistake has been made in grading your Exam, you must submit your entire exam for regrading WITHIN TWO DAYS OF THE DATE THAT I HANDED IT BACK IN CLASS. There is only one way to submit exams for regrading: hand it to me either before or after class. You must attach to your exam a succinct note explaining precisely what mistake you think that I made. Indicate which question you are talking about and why you think your answer has more merit than I thought it did. Exams submitted after the two day deadline will not be regraded.

THERE IS NO WAY TO EARN EXTRA CREDIT IN THIS CLASS. YOUR GRADE WILL BE DETERMINED SOLELY BY YOUR PERFORMANCE ON THE THREE EXAMS.

OFFICE HOURS

If you want to meet with me one-on-one outside of class, my office hours reserved specifically for this class are **MONDAY-FRIDAY, 3:00pm - 4:00pm**, in MBB 1.312AA. You can just drop by without an appointment during these times. If you have a compelling reason to see me outside of my office hours, please send me an e-mail (jaf@mail.utexas.edu) to arrange an alternate appointment, and I will accommodate you if I am able. I read and answer my e-mail every single day, but I hate my telephone passionately. I will attempt to answer simple questions (if there are such things) via e-mail. It is not possible for me to answer complex questions about the course material by e-mail or over the telephone.

My office hours are not meant to be a substitute for going to Discussion Session. For example, it is unlikely that I will be able to spend the entire hour with you, as others may be waiting. Office hours are meant to be a different and supplemental experience - a chance to ask me specific things about the course material that maybe you didn't get a chance to ask in Discussion Session, or a chance to discuss a topic with me that you did not have time to discuss in enough detail in Discussion Session.

PLEASE DO:

- Come to my office hours to introduce yourself! I'd love to get to know you. I'd like to do what I can to make your learning experience at UT more meaningful and more fun.
- Come to my office hours to ask me questions (easy ones or hard ones) about the course material. I love clarifying concepts one-on-one. Teaching undergraduates about genetics is one of my favorite parts of my job.
- Come to my office hours with a flash drive to get a tape of a lecture you missed. I record the lectures in case you are sick and miss a class.

PLEASE DON'T: (alternate title: a list of ways to annoy the Professor)

- Do not come to my office hours to ask me to explain something to you if you have not done your part of the job - meaning done the assigned reading for that topic.
- Do not come to my office hours to ask me what the test is going to be like. This is a waste of time for both of us.
- Do not come to my office hours to ask me why I gave you fewer points on your exam than you think you deserve. I will discuss that with you, but in writing, not in person during my office hours. (See above for how to submit exams for regrading.)

WHO AM I?

Who is Janice Fischer and why does she get to teach me Genetics? Good question! I am a tenured Full Professor here at UT. I earned my PhD in 1988 in Biochemistry and Molecular Biology at Harvard University. My research was about gene regulation using *Drosophila* (fruit flies) as a model system. Then I did postdoctoral research at UC Berkeley and MIT where I learned a lot more about *Drosophila* genetics and development. I started out as an Assistant Professor here at UT in 1993, and I have been teaching BIO 325 since 1996. For 10 years, I used to teach a graduate course about genetic model systems and I am thinking about morphing this class into an Advanced Genetics class that will be available in a year or so under the number BIO366R. My other job at UT is to run my research lab, which is in MBB. I have several PhD students and undergraduates doing research in my lab. We use *Drosophila* as a genetic model system to understand molecular aspects of development, such as how cells communicate with each other to form patterns and organs. I discovered during my junior year in college, when I learned about the genetic code, that I wanted to be a molecular geneticist – and here I am!! I love genetics – and my aim is to transfer that to you. As per University Guidelines, my resume is posted on Blackboard.

UNIVERSITY POLICIES

Information about University of Texas policies pertaining to each of these subjects is available on the UT website.

Administrative Deadlines: It is your responsibility to keep track of the deadlines for dropping the course, changing to Pass/Fail, etc., etc., etc.

Academic Dishonesty: There is a ZERO TOLERANCE policy for academic dishonesty of any kind in this class. Don't even think about cheating on an exam in any way whatsoever.

Special Needs: If you need special treatment for a disability or for religious reasons, it is your responsibility to inform me of these matters in a timely manner and strictly according to University guidelines.

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COURSE SCHEDULE

DAY/DATE	TOPIC	CHAPTER	TOPIC
MON July 11	1	1	Introduction: What is a gene?
TUE July 12	2	2	Mendel's Laws
WED July 13	3	3	Genotype and Phenotype I
THURS July 14	4	3	Genotype and Phenotype II
FRI July 15	5	4, 12	Chromosomes, Sex Determination, Sex Linkage
MON July 18	6	5	Linkage and Gene Mapping I
TUE July 19	7	5, 6	Gene Mapping II and Recombination Mechanism
WED July 20	8	7	Mechanisms of Mutation
THURS July 21	9	7	Using Mutations to Understand Genes
FRI July 22	10	7, 8	The Genetic Code
MON July 25			Exam 1: TOPICS 1-7
TUE July 26	11	9	Recombinant DNA Technology I
WED July 27	12	9	Recombinant DNA Technology II
THURS July 28	13	9	Recombinant DNA Technology III
FRI July 29	14	11	Distinguishing Individuals by their DNA
MON Aug 1	15	11	Cloning Human Disease Genes
TUE Aug 2	16	*A,*E, supp	Transgenic Animals and Gene Therapy
WED Aug 3	17	13	Chromosome Rearrangement and Transposons
THURS Aug 4	18	13	Ploidy
FRI Aug 5			Exam 2: TOPICS 8-15
MON Aug 8	19	14	Bacterial Genetics
TUE Aug 9	20	14, 18, supp	Extranuclear Inheritance
WED Aug 10	21	15	Gene Regulation I: Prokaryotes and Eukaryotes
THURS Aug 11	22	16, 12, supp	Gene Regulation II: Epigenetics
FRI Aug 12	23	17	Genetics of Cancer
SATURDAY AUGUST 13			COMPREHENSIVE FINAL EXAM: 9:00am – noon

*Web Supplement: Genetic Portraits of Model Organisms – A, B, C, D, E
http://highered.mcgraw-hill.com/sites/007352526x/student_view0/genetic_portrait_chapters_a-e.html

supp = supplemental reading for this topic will be posted on Blackboard