

Biology 4350: DNA: The Code of Life

(Spring 2011)

Professor: Dr. Jennifer Cooper

Office: N261 (Naraghi Hall of Science)

Office Hours: Tuesday, Wednesday and Thursday, 11:00 am - 12:15 pm

Email: jcooper3@csustan.edu (always include BIOL 4350 in subject line)

Class time: TR 9:30 – 10:45 p.m.

Class location: C214

Text: "Introduction to Genetic Analysis" Griffiths, et al. 9th ed. ISBN: 0716768879 ***Iclickers are required***

Course Website:

All classroom materials (lecture outlines, assignments, journal article pdf files, links of interest and grades) will be available through the Moodle website.

<http://biology.csustan.edu/Biology/biology-moodle/>

Your Moodle login for this course is the portion of your email address before the @ (**xxxx@csustan.edu**). Initially, your password will be set as your CSU Stanislaus ID (the number on your ID card, including any zeros at the beginning). The first time you log in, Moodle will ask you to change your password, and you can choose whatever you like as long as it conforms to the password criteria set by Moodle. **WRITE THIS PASSWORD DOWN.** About 1/3 of BIOL 4350 students forget their passwords at some point in the semester, so prepare for that and write the password down and keep it in a protected place.

Learning Objectives

This course will focus on understanding the processes in molecular genetics and inheritance, the development of genetics as a science, and the interaction between genetic technologies and services and modern life.

1. Provide an overview of the issues, principles, methodologies, and perspectives of genetics;
2. provide a working background to critically evaluate relevant issues within the field of genetics and develop continuous inquiry and life-long learning;
3. explore the relationships between the fields of genetics, biology, chemistry, ecology, ethics and the other sciences with an emphasis on how these fields are closely inter-related;
4. develop more informed and responsible citizens with respect to issues concerning genetic technology, genetic services and genetic health.

Study skills

Genetics is a content-heavy subject, full of complex concepts and with a great deal of specialized terminology. No matter which professor teaches it, it typically covers 2 textbook chapters a week. Although this is a course which meets a General Education requirement for many majors, do not make the mistake of assuming that it will be easy, **and in particular do not underestimate the level of difficulty of the exams.** Learning takes time and effort, and if you do not devote substantial amount of time (9-10 hours a week) to keeping up with the material in this course, you will probably fail. If you adopt the 5 habits outlined below from Day 1, the probability that you will succeed in this course will be greatly enhanced:

1. Read the assigned chapter or journal article before class. It is normal to be confused by some of what you read, but if you preview the material before the lecture you will understand concepts more quickly and retain more information. There is also a wealth of material available on the website associated with the textbook.
2. Attend class, listen carefully, and take good notes. I suggest you print the Power Point lectures ("handouts" format) before class and take your notes in the margins.
3. Review your notes and assigned reading within 24 hours. When you study, don't fool yourself! When you page through the text book, everything will look familiar. This doesn't mean that you personally own the knowledge yourself. Challenge yourself! After each class day, without looking at your notes or the book:
 - a) Write down a list of the topics and subtopics covered.
 - b) Try to explain the major concepts in your own words.
 - c) Write down key words and their definitions.
 - d) Make your best sketch of the figures/illustrations presented.

After this, open your text and see how well you did. The parts you missed entirely are the parts you need most to study, the parts you partially remembered also need some attention. The parts you know perfectly are part of your own knowledge set.

4. Form a study group that meets regularly so you can talk about new concepts and review terminology with your colleagues.
5. Visit the Tutoring Center. Students are scheduled with tutors for 55 minutes sessions. Each student is allowed 2 sessions a week for two different subjects. Sessions are scheduled depending on tutors and students availability. Tutors for math and writing are available during schedule walk-in hours. No appointment is necessary.

Vasche Library Room L-112
Tutoring Center: (209) 667-3642
Writing Center: (209) 667-3465
E-mail: Tutoring@csustan.edu

If you need clarification of a particular point or concept during lecture, feel free to raise your hand and ask a question. Chances are good that you are not the only one who is confused. If you have extensive questions or have issues that cannot be resolved during lecture, talk to me before or after class, contact me via email, or visit during office hours.

The schedule and procedures in this course are subject to change in the event of extenuating circumstances.

Grading:

Most of your grade for the lecture portion of the course will be based on exams. All exam grades will be used to calculate the final grade (no dropping the lowest grade). Participation points will be available daily in lecture, during the entire class period, through engagement with your clicker. These questions are designed to make sure you are regularly attending, studying and reading. Questions (in a true/false or multiple choice format) will test your comprehension of that day's lecture material, as well as material covered in previous lectures and assigned reading.

There is a total of **500 points** to be earned during the course of the semester. Final course grades will not be curved, but one 30 point extra credit opportunity will be given midway through the semester.

Exam 1, 2 and 3 = 100 points each = 300 points

Final Exam (cumulative) = 100 points

Iclicker daily participation = 50 points

Final Paper = 50 points

Grading scale:

- A = 90% - 100%
- B = 80% - 89%
- C = 70% - 79%
- D = 60% - 69%
- F = 59% and below

The census date is February 23. This is the last day you can drop the class or change to CR/NC (Credit/No Credit) without my signature. After the census date, to change your grading option to CR/NC, you must fill out a yellow Add/Drop form (drop the course for credit and add the course for CR/NC) and ask for my signature.

Final Paper

During the course of the semester you will be given assigned reading from the primary literature on the topics treated in the lecture. "Primary" literature is a term used to describe articles that are published in peer-reviewed journals (secondary literature is published in popular journals such as Scientific American or textbooks, and the "gray" literature is published in venues with no organized quality standards).

This reading will introduce you to the scientific literature of the entire field of genetics. For your paper assignment, you will focus on a topic with relevance to human genetics (human genetic diseases, human population genetics, reproductive technologies, human behavioral genetics, etc). You will write a 5-page review of the primary literature of your chosen topic.

I will provide detailed instructions on this paper later in the semester, but you should think about this assignment as you read and listen to lectures. The final paper will represent a substantial portion (10%) of your total grade for this course, thus the assignment should be taken seriously.

Iclicker registration:

You are required to purchase an iclicker remote unit for in-class participation. If you already have an iclicker you may use it for this course (and any other course) and you can even borrow a friend's as long as you register it for this course under your name (2 people can't share a clicker unit). Iclicker is a response system that allows you to respond to questions I pose during class, and you will be graded on questions given using this system.

Each clicker has a unique serial number on the back of the remote unit. Place a piece of scotch tape over that bar code and ID to preserve it.

In order to receive credit for your votes, you will need to register your Iclicker remote unit online. You must have come to class at least once and voted on at least one question, in order to complete this registration properly. We will accomplish this first voting session during the second lecture.

After you have voted, go to www.iclicker.com/registration. Complete the fields with your first name, last name, student ID (this is your 9 digit CSU student ID number, including the zeros), and remote ID. The remote ID is the alphanumeric code found on the back of your iclicker remote unit, below the bar code.

Accomplish the web registration as soon as possible, to help me keep track of your grades. You will earn daily points even if you are not registered; as soon as you register, your votes will be allotted to your account. The iclicker response system will be used every day in class, and you are responsible for bringing your remote daily. If you forget your remote, you will not be eligible to earn points that day.

Pull the plastic tab from the back of your remote before use to activate batteries. To change (3 AAA) batteries when needed, place a pen cap in the battery notch (red flashing "low battery" light = ~10 hours still remaining). All remotes have a 200 hour battery life, so this should last a full semester or more. If you ever need to reset the frequency code on your remote unit, our class will use the code "AA".

Exam protocol:

1. Exams 1-3 will be given in our classroom (C214) during the scheduled lecture period. The final exam will be given in our classroom (C214) on Thursday, May 26, 8:30 a.m.-10:30 a.m.
2. Exams will consist of multiple choice, fill in the blank and short essay answer. You will be required to read and interpret diagrams, and add missing information to them. Exams will be challenging, but will not be designed to confuse or trick you. Always feel confident to raise your hand and request clarification on the meaning of a question.
3. If you are late then you will have less time to complete the exam. You will not be given extra time to complete an exam. Students who arrive after the first exam of the day has been turned in will not be allowed to take the exam.
4. It is your responsibility to notify me at least 1 week prior to missing an exam and to supply me with a valid, written explanation. If you miss an exam for any reason, you must take an alternate exam before the in-class exam is scheduled to take place. This alternate exam will not be similar to the in-class exam. It may be more difficult, and it will certainly have a different format. If you miss an exam unexpectedly, and do not have documentation of a legitimate reason for doing so, you will not be allowed to take the alternate exam, and your total exam points will be based on the average of your other in-class exams.
5. Always bring at least two #2 pencils and a Scantron form 882-E to the exams.
6. Always bring some form of photo identification to the exams. When you turn in your exam, you will be required to show identification. This is a strategy to prevent academic dishonesty.
7. You must not leave the room during an exam without my permission. If you must leave the room for personal reasons, you will not be allowed to finish the in-class exam. Your partially finished exam will be graded as it stands.
8. When you arrive on exam day, place all of your belongings (purses, backpacks, jackets, notebooks) at the front of the room. No loose papers can be visible. You must turn off cell phones and remove baseball caps. If you are observed looking at your neighbor's exam, loose papers, a cell phone or another electronic device during an exam, it will be considered evidence of cheating (see the section below on academic dishonesty).
9. The Scantron machine sometime makes mistakes, particularly when you change an answer and do not completely erase the other choice. The final answer will be the Scantron result, so make sure your answer is clear, and that it truly reflects your final choice. Even if you circle another answer on your test copy, you will be graded on your Scantron choice.
10. I will return your graded exams for you to use as a study resource.

Class protocol:

You are adults. You will be expected to act as such. I will treat you with respect, and you will treat me and your fellow students with respect. To accomplish this goal, I ask you to abide by a few simple rules of conduct:

1. Do not disrupt the class by talking or any other means. Use discretion and speak quietly if you ask your neighbor for clarification of a point during lecture.
2. Cell phones will be turned to “silent” or turned off entirely. Do this at the beginning of class. **Do not text during class. I hate this.**
3. Put away newspapers, books and other materials unrelated to the course at the beginning of class.
4. I will not enforce a “no food or drinks” policy, because I understand that it is not always possible to eat between classes. However, I ask that you consume quietly, avoid spills, and clean up your crumbs and trash when you leave. Avoid food with strong smells that may be distracting to others.
5. Only bring your laptop to class if you plan to use it in a way that helps both you and your neighbors stay focused on biology. If it comes to my attention (ie. if another student mentions) that you are surfing the net or playing games during class, you will be asked to leave and you will not be allowed to use your laptop in my class again.

Keep in mind that I will not hesitate to interrupt the lecture and request you to modify your behavior. If you disrupt the class excessively you will be asked to leave. Act courteously, follow the rules and avoid embarrassment.

Academic Dishonesty

There is a zero tolerance policy for cheating. Any academic dishonesty will result in an F in the class and the matter will be turned over to the appropriate student disciplinary committee.

Examples of academic dishonesty:

1. Excessive collaboration with a fellow student on the final paper or extra credit assignment.
2. Plagiarism from any source whatsoever. **This includes cutting and pasting from internet sources into your final paper.** All final papers will be scanned using plagiarism detection software.
3. Submitting an exam for another student, or allowing an exam to be submitted for you by someone else.
4. Looking at another student’s exam or iclicker answers.
5. Looking at any unapproved written material or electronic device while taking an exam. This includes looking at your cell phone if you receive a call, even if you don’t answer the phone.

Evolution

Evolution by means of natural selection is the unifying theme of biology, thus discussion of evolution is central to this course. In class we will discuss scientific evidence for evolution. Students should not feel threatened by the study of evolution regardless of their personal beliefs. I do not require you to change your belief system in the slightest to succeed in this class. You are only required to learn and understand the information presented, and behave in a way that fosters a positive learning environment.

Course Schedule:

Date	Lecture	Chapter
Jan. 27	Introduction and the Scientific Method	1
Feb. 1	Single-Gene Inheritance	2
Feb. 3	Independent Assortment of Genes	3
Feb. 8	<i>Ch. 3 continued</i>	
Feb. 10	Mapping Eukaryote Chromosomes by Recombination	4
Feb. 15	The Genetics of Bacteria and their Viruses	5
Feb. 17	EXAM 1	
Feb. 22	Gene Interaction	6
Feb. 24	DNA: Structure and Replication	7
Mar. 1	<i>Ch. 7 continued</i>	
Mar. 3	RNA: Transcription and Processing	8
Mar. 7	<i>Ch. 8 continued</i>	
Mar. 10	Proteins and their Synthesis	9
Mar. 15	Regulation of Gene Expression in Bacteria and Viruses	10
Mar. 17	Regulation of Gene Expression in Eukaryotes	11
Mar. 22, 24	Spring Break holiday NO CLASS	
Mar. 29	EXAM 2	
Mar 31	Cesar Chavez holiday NO CLASS	
Apr. 5	The Genetic Control of Development	12
Apr. 7	Genomes and Genomics	13
Apr. 12	<i>Ch. 13 continued</i>	
Apr. 14	The Dynamic Genome	14
Apr. 19	Mutation, Repair and Recombination	15
Apr. 21	Large-Scale Chromosomal Changes	16
Apr. 26	EXAM 3	
Apr. 28	Population Genetics	17
May 3	Quantitative Genetics	18
May 5	Evolutionary Genetics	19
May 10	Gene Isolation and Manipulation	20
May 12	<i>Ch. 20 continued</i>	
May 17	Discussion on Medical Genetics and Reproductive Technology	
May 26	FINAL EXAM 8:30 a.m.-10:30 a.m.	