

## BIOL 3000: Frontiers in Biology, Spring 2013

Professor: Dr. Jennifer Cooper  
Office: N256  
Office hours: Tuesday 9:30 – 11:30  
Thursday 12:30 - 1:30  
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*“Nothing in biology makes sense except in light of evolution.”* -- Theodosius Dobzhansky (1973), geneticist & zoologist

The quotation above is one that is known to every biologist. Evolution is **the** central and unifying principle of modern biology and is an experimental, observational, mathematical and correlative science. In this course, we will:

1. Explore how evolutionary forces may have shaped human behavior.
2. Discuss what scientists have discovered about the genetic and physiological foundations of behavior.

### REQUIRED TEXTS/MATERIALS

*Evolution and Human Behavior*. Cartwright, 2<sup>nd</sup> edition, ISBN: 9780262533041.

Visit the Blackboard course site often for announcements, quizzes, and material.

I will not be making PowerPoint lectures available for student download, so take notes during lecture.

### CENSUS DATE

This course can be taken for a letter grade, or it can be taken on a credit/no credit basis. Students can only drop this course prior to the census date of February 22. Before the census date they can change their grading option without my permission, but after the census date it requires my signature on the “Registration Options” form to do so. I am willing to sign this form up to the last class meeting (May 17).

### GRADING PROCEDURE

Blackboard quizzes	150	
Class participation	100	
Final article summary	50	
Poster presentation	100	
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Total	400 points	No +/- grading will be applied to your final grade.

### BLACKBOARD QUIZZES

There will be a quiz over each assigned chapter, for a total of 15 quizzes (chapters 14 and 15 will be treated as a single chapter). Quizzes will be timed (~10-15 minutes), and will typically consist of ~10 multiple choice questions. Questions can come from lecture, BB items, and in-class videos.

### CLASS PARTICIPATION

An integral goal of this course is your development of critical thinking and written and verbal communication skills. Lectures, videos and group-based assignments will guide you in the development of these skills. I will assume you have read the associated material listed in the schedule **before** class and I may call on you to participate in discussions. It's ok if you don't understand everything that you read, because class lectures and discussions are intended to clarify your understanding. I will assess each student's participation based on their level of preparation and their willingness to engage, not on their understanding of genetics. But if you are often absent, or consistently demonstrate that you have not done the reading and are unwilling to think about the material, then I will dock your points. **Hint: for a student who is weak in their scientific understanding, a very high level of participation can make their grade.**

### FINAL ARTICLE SUMMARY

The general review article “Genetics of Human Social Behavior” (2010, Ebstein et al, *Neuron*) is posted on the Blackboard site for this course. You should print this article and read it carefully at the beginning of the semester, and then several times throughout the semester. This article was written by scientists for other scientists, so your understanding will be limited at first. As we progress through the course, we will address most or all of the reviewed topics, and your

understanding will grow very quickly. Midway through the course I expect you to choose the topic in human behavioral genetics that is most interesting to you, explore it further, and write a summary of the current research (3 pages, 12 pt font, double spaced). Many other students will have chosen your topic, and you will work as a group to combine your summaries into a poster presentation.

### POSTER PRESENTATION (GROUP ASSIGNMENT)

Each student in the class will select a topic relating directly to human behavioral genetics, from a list of available topics provided by the instructor. All students who have chosen the same topic will work together to search for material on this topic, and create a **single** poster to present as a group at the end of semester Poster Session. Poster presentations are common at scientific conferences, because they allow for a personalized interaction between the presenter and the individual audience members, as conference attendees walk through the poster session browsing the selections. Posters have the added advantage of being less intimidating to present, since the audience has something to read and the presenter can mainly clarify points and field questions.

It is easy to use Microsoft PowerPoint to prepare a poster presentation, simply by adding components (text boxes, images) to a single slide. You must format the slide as a custom size and indicate how large a print you want your final poster to be. **Your poster for class must be printed on a large format printer at a professional printing service (Kinko's, Staples, etc), and must be a minimum of 36 x 24 inches in size.** Although I provide some rough guidelines for pricing below, talk to your print shop ahead of time to find out at what size they print posters, cost, and how long it takes.

- The main goal of a poster is to relate the main points of your topic with as little effort as possible on the part of the audience to read, interpret, and understand. Only present the main points.
- Use a suitable font size (can be read from about four feet away).
- Sections should have appropriate labels.
- Include a Title, and the list of student authors.
- Graphics are required (figures, special equations, photos).
- Include a short list of the sources you used (the Ebstein *et al* paper, OMIM, NCBI, Center for Evolutionary Psychology, new media).
- Present as clearly as possible, and used bulleted lists instead of paragraphs when you can.
- Use graphics to explain sections when possible.
- **Do NOT plagiarize sources. Re-write everything in your own words. Plagiarism is very easy to detect using Google and specialized software, and if I detect plagiarism in your work I will regretfully give you an F in the course.**

### PRINTING YOUR POSTER

**FedEx Kinkos** [www.kinkos.com](http://www.kinkos.com) (800) 463---3339 1451 Geer Rd, Turlock, CA 2225 Plaza Pkwy # C11, Modesto, CA

**Services:** Black and white or full color, several paper types, online print orders

**Time to print:** Approximately 2 hours for black and white, 24 hours for color. Send your file by e---mail and it will be ready for pick up when you arrive.

**Cost:** 30" x 36" Color \$58, B&W \$6

**Staples** (209) 632---2209 1850 Countryside Dr, Turlock, CA

**Services:** Black and white or full color, several paper types, online print orders and mail delivery

**Time to print:** 2---3 hours for color, black and white 1 hour

**Cost:** 36" x 48" Color \$84, B&W 7 or 24" x 36" Color \$45, B&W \$4

### STUDENT LEARNING OBJECTIVES:

1. Students will become familiar with basic human genetics and evolutionary theory.
2. Students will explore the current scientific understanding of how evolutionary forces may have shaped the behavior of species ancestral to humans.
3. Students will develop a basic understanding of the link between genes, physiology, brain structure, and behavior.

### LECTURE OUTLINE AND READING ASSIGNMENT

Reading assignments listed on the course outline are for *Evolution and Human Behavior* by Cartwright.

Extra content: Links to “BB” items can be found on the BIOL 3000 Blackboard site.

Week	Lecture and (Presentations)	Reading	Extra Content
1/28 - 2/1	Introduction Basic genetics		In-class video: Epigenetics
2/4 - 2/8	Genes, Proteins and Behavior		In-class video: “Deconstructing Obesity” In-class video: “Exploring Obesity”
2/11 - 2/15	Evolution and theories of mind and behavior	Ch 1	In-class video: Understanding Evolution
2/18 - 2/22	Darwinism, inclusive fitness and the selfish gene	Ch 2	BB article: Charles Darwin and Psychology
2/25 - 3/1	Sex, sexual selection and life history theory	Ch 3, plus p.165-167	In-class video: The Brain Game, What’s Sex Got to Do With It?
3/4- 3/8	Foundations of Darwinian psychology	Ch 4	
3/11 - 3/15	The evolution of <i>Homo sapiens</i>	Ch 5	In-class video: What Makes Us Human?
3/18 - 3/22	Encephalization and the emergence of the human mind	Ch 6	In-class video: How Smart Can We Get? BB article: Bad at Estimating? BB Poll: Is Intelligent Life Inevitable?
3/25 - 3/29	Emotions Kin selection and altruism	Ch 8 Ch 9	BB article: Greed Does Not Compute
4/1 – 4-5	<b>SPRING BREAK</b>		
4/8 - 4/12	Conflict within families and other groups	Ch 10	
4/15 - 4/19	Human sexual behavior: mating systems and strategies	Ch 11	BB Poll: Is love in our DNA? BB article: Cheating Cheetahs Prosper
4/22 - 4/26	Human mate choice Incest avoidance	Ch 12 Ch 13	In-class video: Love, Love Me Do BB Poll: Babies by Design
4/29 - 5/3	Mental disorders	Ch 14-15	In-class video: Braff on Schizophrenia
5/6 - 5/10	Mental disorders cont. The evolution of culture	Ch 14-15 Ch 16	
5/13 - 5/17	Ethics	Ch 17	Guest lecture: Genetics and Economics
5/22	<b>Poster Session 2:00 p.m.-4:00 p.m. in the regular classroom</b>		