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HEB 1250: Genetics and Human Evolution

Fall 2017

Wednesday 3-5, MCZ 539

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Office Hours: by appointment
Prerequisites: LS1b or permission of the instructor

Course description

In this course, we will explore major questions in human evolution using genetic data. First, we will learn about major events in the human past through the lens of genetics. Then, we'll focus on how genes and the environment have worked together to shape the human genome. Last, we'll use the knowledge we've gained in the course so far to think about how human history impacts health and medicine today.

Course Aims and Objectives

This course has multiple aims. First, you will expand on your knowledge of genetics and gain exposure to how researchers use genetics to answer questions about human and evolution and biology. The second aim of this course is to make you competent interpreters and presenters of science. We will read scientific papers, interpret them and gain experience communicating science in writing and verbally.

The course is designed at an introductory level. Even so, modern genetics is filled with terminology and ever-changing methods. I don't expect that you'll immediately understand everything you read. In class, we'll talk through the papers carefully and I'll help plug holes in your knowledge. You also will give 3 short presentations during the term so that you can gain public speaking experience and practice talking through topics that were at first difficult for you. Each presentation will be accompanied by a short written review of the same topic. By integrating presenting and writing on the same topic, you will gain a comprehensive understanding of it.

Course Materials

Course readings will primarily consist of scientific papers. All readings will be available through the Canvas site.

Assignments and Grading

The course is divided into 3 units. For the first two units, you'll give a 10-minute presentation on a topic of your choice from that unit and also will submit a 3 - 5 page

written review paper on this topic. For the third unit, you will give a slightly longer presentation on any topic that interests you in the course (or related) and will submit a 6 - 8 page review on it.

Grades will be determined by your work on these 3 oral presentations and reviews, as well as a few smaller assignments, your attendance, participation, and the effort you put into responding to reading questions each week.

Detained information on the presentations and reviews can be found at the end of this syllabus.

Grading breakdown
Basic Concept Questions: 1%
Draft Presentations: 3%
Presentation 1: 7%
Review 1: 7%
Presentation 2: 12%
Review 2: 12%
Presentation 3: 17%
Review 3: 20%
Reading questions: 5%
Class participation (including attendance/feedback on other's work): 15%

Reading questions and draft presentations will be graded 0/1/2 to assess effort.

Course Policies and Expectations

Because attendance is critical to the learning process in this class, it is required. If you need to miss a class meeting for a legitimate reason please let me know at least a week beforehand. Absences due to health require UHS documentation. Late written assignments will be penalized 10% a day starting at the time the paper is due.

Reading questions and are due at 10 am on the day of that class meeting. Presentation drafts and reviews are due at 3pm (class meeting time).

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Academic Integrity and Collaboration

Harvard's Honor Code states: *Members of the Harvard College community commit themselves to producing academic work of integrity – that is, work that adheres to the scholarly and intellectual standards of accurate attribution of sources, appropriate collection and use of data, and transparent acknowledgement of the contribution of others to their ideas, discoveries, interpretations, and conclusions. Cheating on exams or problem sets, plagiarizing or misrepresenting the ideas or language of someone else as one's own, falsifying data, or any other instance of academic dishonesty violates the standards of our community, as well as the standards of the wider world of learning and affairs.*

For written and oral presentation assignments in this course, you may consult with your classmates on topic choice. You may exchange ideas about your topics, however, you should ensure that any written work you submit is the result of your own research and writing and that it reflects your own approach to the topic. You must adhere to standard citation practices and properly cite any books, articles, or websites that have helped you with your work. If you received any help with your writing you must acknowledge this assistance as well.

Accommodations for students with disabilities

Students needing academic adjustments or accommodations because of a documented disability must present their Faculty Letter from the Accessible Education Office (AEO) and speak with the professor by the end of the second week of the term. Failure to do so may result in an inability to respond in a timely manner. All discussions will remain confidential, although faculty are invited to contact AEO to discuss appropriate implementation.

Course Outline

September 6: Introduction to the course

Unit 1 | What can the history of our genes tell us about the past and present?
- September 13: Genes as markers of the past
- September 20: Human origins and migrations/writing workshop
- September 27: Human/archaic admixture
- Cctober 4: Unit 1 presentations

Unit 2 | What can the history of our genes tell us about our biology?
- October 11: Genetic adaptations
- October 18: Human adaptations (diet)
- October 25: Human adaptations (climate)

November 1: Unit 2 presentations

Unit 3 | What can the history of our genes tell us about our health today?

November 8: Human genetic diversity
November 15: Students' choice
November 22: No class (Thanksgiving)
November 29: Personal medicine
Reading Period: Final presentations

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Presentations and reviews

Learning goals: The primary goals of these assignments are to increase your abilities as interpreters of science, public speakers and scientific writers. In this course, speaking and writing will be integrated in your learning process. For this reason, reviews are due the same day as your in-class presentation.

Submission guidelines: Please submit both your presentation slides and review to the canvas site no later than 3pm on presentation days. Late papers will be penalized 10% per day, beginning at 3pm.

Grading scheme: You will be given a grading rubric for the presentations and reviews. The proportion of your final grade each presentation and review comprises increases over the course of the term, so that your work later in the term, when you have had more practice speaking and writing and also have a more comprehensive understanding of the genetics material, counts more.

Expectations: We will discuss the specific expectations for the presentations and reviews in class, but to give you an idea:

Presentations 1 and 2: You will present on one scientific paper related to the themes of units 1 and 2.

Reviews 1 and 2: These written assignments will place the paper on which you presented into broader context by reviewing it, along with 3-4 other papers that address the same question or related ones.

Presentation and Review 3: As your final work in the course, these are aimed to be broader in scope than the first two presentations and reviews. As such, they will synthesize information from more primary sources.

For each presentation and review, you will have the opportunities for feedback prior to the due-date. Presentations will be evaluated on both your content and delivery. Reviews will be evaluated on both content and how clearly your writing expresses the science.