

BIO 419: Human Evolution

Fall 2021 – Fridays at 3:30-6:15PM (15min break) – Room 203 Science

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Office Hours: Monday, Tuesday, Wednesday 11:30AM-1:00PM

This course explores the fossil, genetic and other evidence for the history and evolution of primates, and above all, of one primate in particular: *Homo sapiens*. We will retrace the emergence of hominins and *Homo sapiens* in Africa, and their migrations out of Africa and across the world, against the background of the climatic, ecological, and geological changes of these times. The prerequisites are BIO 201 Genetics and BIO 217 Evolution, or permission of instructor.

The course can be taken as a Biology undergraduate capstone course (BIO 419), and as a Biology graduate-level elective (BIO 519) in the area of Ecology and Evolution. If you are an undergraduate Biology major taking it as a capstone course, then like all capstone courses, it can also be applied to any other requirement of the major at the same time, if it would fulfill that requirement on its own. By permission of the instructor, this course may also be taken as BIO 441 (Problems in Biology), by Biology majors and other majors, for credit as a non-capstone Biology elective. (For those who take this option, the course will appear on your transcript as “BIO 441 Problems in Biology—Human Evolution.”)

All students take the same tests, and all tests are graded on the same scale. A major research review paper is also required (except for those taking the course as BIO 441). The paper must relate to social or biological evolution and to primates. Aside from those requirements, wide latitude is allowed in choosing a topic, to increase your chance of finding one that is particularly meaningful and fascinating to you. We will begin with a discussion of ideas, tools and processes that will help you find a suitable topic. As outlined on the next page, your paper will develop through several stages, with firm deadlines, and you will meet with me at each stage. This project should be educational for you and interesting for both of us. You will need to get started right away so that you have time to do a proper job. You must leave time for a thorough review and revision of your paper with me.

There is no textbook for this class. I will recommend some books with pertinent background information for this class, and will provide capsule reviews of these books. The books will only be suggested readings, but if you open any of them at random and read, you may get hooked.

The final exam will be comprehensive. You may take it at any convenient time between 10:00AM and 3:00PM, on Thursday or Friday of finals week. Just show up at my office/lab to take it.

Note the meeting time: 3:30 PM to 6:15 PM. This includes a short break in the middle of the class.

General Learning Objectives of the Course

To know the outlines of primate classification, including major groups, ranges and defining traits

To know the main representative lineages of primate and hominin evolution in the fossil record

To gain a functional understanding of the anatomy and physiology of humans as compared to apes

To have a general understanding of the migrations of hominins out of Africa, by routes and times

To be familiar with the genetics-based reconstruction of hominin evolution, global migration, and mingling

Learning Objectives Specific to Scientific Writing

- To make oneself an expert about a narrowly-defined term-paper topic of research, in human origins
- To become intimately familiar with the relevant literature, thus becoming an authority on this chosen topic
- To compile a representative bibliography of this literature in an accepted format, convenient for scholarly use
- To distill the knowledge contained in these sources into a lucid, compact, integrated, definitive report
- To incorporate appropriate citations of references in the text so that a reader can verify all statements of fact
- To assure completeness of scholarship by fully utilizing the power of advanced Google Scholar
- To know available methods and strategies for identifying essential papers and books on any chosen topic
- To be able to reconstruct the “ancestry” of a scientific paper—or a topic—by retracing references
- To be able to locate all the “descendants” of a scientific paper by using science citation index
- To be able to distill the meaningful core of a scientific report into an informative abstract
- To be able to critically evaluate the information available on a chosen topic, logically and statistically

Learning Objectives for Writing Skills in General

- To acquire the habit of critical revision in writing
- To aim to achieve brevity while retaining essential meaning
- To appreciate the proper role of punctuation in the service of clarity
- To explore and compare alternative formulations of vocabulary, phrasing, and structure

Outline of Lecture Topics (14 lectures)

This outline may be re-proportioned during the semester.

The Times of Primates, and of Hominins (2)

The Geology and Ecology of the Cenozoic Era and the Quaternary Period

Primate Systematics and Evolution (2)

The Phylogenetic Tree of Prosimians, Anthropoids, and Hominoids

The Fossil Record of Primates and Hominins (3)

Ape and Proto-Human Fossils and Artifacts

The Functional and Adaptive Evolution of Hominins (3)

The Anatomical, Physiological, and Neurological Story of Human Origins

The Genetic Reconstruction of Hominin Migrations and Mingleings (4)

The Research Review Paper

The finished research review paper is due on Saturday at the end of final exam week. Three steps must be completed, and three deadlines met, before the finished paper is turned in:

- 1) Discuss with me your choice of a topic, by the fourth Friday meeting.
- 2) Show me your rough, early, compiled notes and sources, by the eighth Friday meeting.
- 3) Meet with me to review your rough draft of the paper, no later than the next-to-last Friday meeting.

I will not accept any paper that has not proceeded through all three of these prior steps. If you present me with a finished paper at the end of the semester that has somehow just “fallen from the sky,” without showing me all these early stages of your work along the way, you will get an Incomplete and will have to write a new paper, on a new topic. (Be advised that this has actually happened.)

Your grade on the paper will partly depend on meeting the deadline for each stage.

Two Small Additional Projects

Student Presentation on a Case of Genocide: A course on human evolution needs a place for the consideration of human *inhumanity*. At its most extreme, this is probably found in massive campaigns of murder and atrocity perpetrated on defenseless non-combatants, whether they are organized and led from above or merely tolerated and tacitly encouraged as national mob actions. These chapters of human history epitomize the downside of our prospects as a species. Unfortunately they are numerous. Other ape species have their characteristic modes and outcomes of social conflict. Can this human behavior be understood within a biological (*i.e.*, evolutionary) framework?

The course will include short student presentations to the class, of around 10 minutes, each describing one case of organized, historically significant mass killing, outlining the essential facts and events, the historical and social background, the contemporary news coverage, the global response, and the aftermath. I will provide books and DVDs via library reserve, on a variety of large-scale mass murders, purges and ethnic cleansings since 1900. The first reference to consult will be the 3-volume *Encyclopedia of Genocide and Crimes against Humanity*. The library is holding my personal copy of this encyclopedia. If you check with me, I can arrange for you to borrow it. See also the websites *Genocide Watch* and *Genocide Prevention Advisory Network*. To prevent duplication, each student will sign up to present one case.

This assignment will be worth 20 points, so is a minor part of the grade. Presentations will be graded on clarity, completeness, and straightforward factuality—it is better to maintain a focus on facts and avoid political judgments or expressions of personal feelings.

A Short Student Presentation on Experiences in the Biology Major at USM: This course includes a second student presentation, which may be either a video or a written statement, giving a retrospective evaluation of the student’s own experiences in the USM Biology Department. (Transfer students should focus exclusively on their experiences here at USM.) These presentations are not for the class but for the Biology Department and are supposed to provide an opportunity for students to reflect on everything they have learned here and its meaning for their lives. Students are encouraged to let us know how they think their experience at USM has prepared them for their life goals, careers, and personal lives—or how it has failed to do so. If students give permission, these videos or written statements may be posted on the USM Biology website. This presentation is also worth 20 points. Note

that you will get all 20 points for any serious and apparently genuine effort, of any length, just for doing it—whether your personal statement is complimentary or even scathing.

Grading

The research paper itself will be graded for a maximum of.....300 points.
 The comprehensive final exam will include 50 short-essay questions.....200 points.
 You will get 10 points for every class that you attend without using a cell phone.....140 points.
 The two small additional projects are worth 20 points each.....40 points.
 Occasional unannounced quizzes or homework may add additional points to the total.

To determine course grades, a scale will be applied to the distribution of point totals among the students in the class. The distribution of letter grades for the class will closely resemble the table below. The table is a combined distribution of grades from eleven previous semesters in classes of mine that were taught in the same general format—Human Evolution three times, The Evolution of Cooperation four times, and Issues in Evolution four times.

Grades	Undergraduate Students	Graduate Students	Total
A	44	28	72
A-	25	6	31
B+	3	2	5
B	7	2	9
B-	2		2
C+			
C	1		1
C-	1		1
D+	1		1
D			
D-	1		1
F	7	1	8

Notes

Cell Phone Use: The ability to carry a small phone in your pocket giving you continuous direct access to the world's people and affairs was a quantum leap in human social evolution. If you have a compelling need to use your phone during class, please leave the room while you deal with the situation. This class is not a place to participate in social media or explore the web. If you use your phone in class I will deduct attendance points.

Plagiarism: In term papers, any item of specific factual information that is not commonly known and was not mentioned in class must have a citation giving the source of that information. If quotes are used they must be enclosed in quotation marks and the source of each quotation must be traceably identified. The incorporation of even part of a sentence from an unidentified, unattributed source, without quotation marks, as if you wrote it yourself, is plagiarism. Any work that contains plagiarism receives a grade of F and may not be redone. If you do not clearly understand what plagiarism is, and University policy with regard to it, it is your responsibility to ask me about it.

USM Discrimination Policy: The University of Southern Maine shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, national origin or citizenship status, age, disability or veteran's status in education, employment, and all other areas of the University. Discrimination inquiries should be directed to Betsy Stivers, Director, Equal Opportunity Center of Excellence. She can be reached at 780-4709 or elizabeth.stivers@maine.edu.

Students with Disabilities: If you need accommodations due to a disability, please contact the Disability Services Center for confidential assistance and accommodation authorization. For more information, visit <http://usm.maine.edu/dsc>.