



ENVIRONMENTAL CHANGE AND HUMAN EVOLUTION (ANTH3491/6491)
Special Topic in Biological Anthropology

Spring 2019

T: 11:10 AM- 1:00 PM

Lecture meets in Rome Hall, Room 351

Course Instructor: Dr. Laurence Dumouchel

Office Hours: Monday, 2:30-4:30 PM or by appointment

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Office Location: Science & Engineering Hall, 6th floor, #6675

COURSE DESCRIPTION

This course will examine the influence of ecological and environmental influences on our lineage from the Miocene to the present, with a focus on the Plio-Pleistocene. The course will be centered around current research findings and their implications, as well as the methods used in the field of paleoecology. Most classes will be organized according to the following format: lecture, discussion, lab visit/exercise.

LEARNING OBJECTIVES

By the end of this semester, students will develop skills allowing them to:

- Be able to identify the important research questions within hominin paleoecology
- Become familiar with the classes of evidence available to hominin paleoecologists
- Know the main analytical and research methods used in hominin paleoecology
- Be able to analyze evidence critically (evaluate strengths and weaknesses)
- Be able to discriminate between evidence and the interpretations placed on that evidence
- Be sufficiently familiar with the paleoecological evidence and the relevant research methods to follow the arguments set out in reviews of the primary research literature
- Know influential researchers in the field of hominin paleoecology

REQUIRED MATERIALS

Specific reading assignments will be posted on Blackboard each week, following the course schedule (subject to change).

EVALUATION

- Discussion and Participation (15%)
 - Students will be assigned one week (or two, depending on the size of the class) to be the discussion leader (10%)
 - Every student is expected to participate in discussions (5%)
- Final exam (30%)
 - There will be one exam - a comprehensive final at the end of the semester covering all topics seen in lecture and readings
- Research projects (30%)
 - See below
- Exercises (5 exercises worth 5% each, for a total of 25%)

RESEARCH PROJECT

Each student will design a research project and frame it around a question relevant to hominin paleoecology. These projects may entail analyzing data available in online databases. Alternatively, students may choose to write a review of a specific topic. Examples and ideas will be provided. The paper should be 10 double-spaced pages (20 pages for graduate students) in length with 1" margins and 12-point font. It should cite 20 primary literature references (30 for graduate students).

GRADING SCHEME

Letter grades are assigned at the end of the semester using the +/- system according to the following chart. **Final grades are not rounded, and there is no extra credit offered.**

A	93%-100%	C	73%-76.99%
A-	90%-92.99%	C-	70%-72.99%
B+	87%-89.99%	D+	67%-69.99%
B	83%-86.99%	D	63%-66.99%
B-	80%-82.99%	D-	60%-62.99%
C+	77%-79.99%	F	0%-59.99%

LATE ASSIGNMENT POLICY

Late assignments are penalized 10% for each calendar day late.

MAKE-UP EXAMS

The date for the exam is posted on the course schedule below. Make travel plans accordingly. A make-up exam may be scheduled in two circumstances, as follows. (1) If you must miss an exam due to an unavoidable conflict, such as observance of a religious holiday or participation in a school-sanctioned sport, you must notify the professor **at least one month prior** to the exam date. (2) If you must miss an exam for an unforeseen medical reason or emergency, **notify the course instructor as soon as possible**. Documentation of your reason for missing the exam (e.g., a note from student health) is required. **The make-up exam must be taken within one week of the original exam date**, except in

rare circumstances. If the course director is not notified of a student's intention to miss an exam until *after* the exam has already been administered in class, the make-up exam may be given in essay format.

RELIGIOUS HOLIDAY

It is completely acceptable for you to miss lecture or lab due to observance of religious holidays. However, it is your responsibility to look ahead on the calendar and notify the instructor of any conflicts (for the entire semester) with lab or lecture no later than the **first month of class**.

BLACKBOARD

Once you are registered for this course, you will automatically have access to the Blackboard site associated with it. Go to <https://blackboard.gwu.edu/> and sign in using your GW NetID and password. We will use Blackboard to communicate announcements, store important documents and external links to web sites of interest that deal with material covered in the course, and provide a way for you to check your grades as the course progresses.

ACADEMIC INTEGRITY

If you have questions regarding your work, please refer to GW's policy on academic integrity, available at <https://studentconduct.gwu.edu/code-academic-integrity>. Academic dishonesty includes cheating, fabrication, plagiarism, falsification, and facilitating academic dishonesty by others.

SUPPORT FOR STUDENTS OUTSIDE OF THE CLASSROOM

- **Disability Support Services (DSS).** Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information, please refer to <https://disabilitysupport.gwu.edu/>
- **Mental Health Services.** The Colonial Health Center offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations; and confidential assessment, counseling services (individual and small group), and referrals. You can reach the Colonial Health Center at 202-994- 5300. For additional information, please refer to <https://healthcenter.gwu.edu/mental-health>
- **International Services Office (ISO).** The International Services Office offers free tutoring and language support for international students who are non-native English speakers. For additional information, please refer to <https://libguides.gwu.edu/c.php?g=576191&p=4068674>

SECURITY

In the case of emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After the evacuation, seek shelter at a predetermined rendezvous location.

***PROVISIONAL* COURSE SCHEDULE**

Date	Topic	Readings
Jan. 15	Introduction to the course What is hominin paleoecology?	N/A
Jan. 22	The geological time scale and climate change	Peppe and Deino, 2013
Jan. 29	Taphonomy	Faith & Behrensmeyer, 2006
Feb. 5	Modern analogs and community ecology	Reed, 1997
Feb. 12	Ecomorphology and taxon-free methods	Barr, 2015
Feb. 19	Soil and enamel stable isotopes	Cerling et al., 2015; Quade and Levin, 2013
Feb. 26	Biogeographic analysis <u>Confirm project topic</u>	Winder, 2014
Mar. 5	Pollen, phytoliths and paleobotanical remains Visit of CASHP phytolith lab	Bonnefille et al., 2004
Mar. 12	Spring Break (No class)	
Mar. 19	ZooMS, ancient DNA and other approaches of the future!	Rawlence et al., 2014; Brown et al., 2016
Mar. 26	Paleoecology in human evolution: the Miocene	Fortelius et al., 2006; Cerling et al., 1993
Apr. 2	Paleoecology in human evolution: early hominins	Levin, 2015
Apr. 9	Paleoecology in human evolution: the genus <i>Homo</i>	Bobe and Behrensmeyer, 2004; Stewart and Stringer, 2012

Apr. 16	Climate change in the Anthropocene	Blois et al., 2013
Apr. 23	FINAL EXAM <u>Project papers due</u>	

Reference list (the articles will be posted on Blackboard)

- Barr WA 2015. Paleoenvironments of the Shungura Formation (Plio-Pleistocene: Ethiopia) based on ecomorphology of the bovid astragalus. *Journal of Human Evolution* 88:97-107.
- Blois JL et al. 2013. Climate change and the past, present, and future of biotic interactions. *Science* 341: 499-504.
- Bobe R & Behrensmeyer AK 2004. The expansion of grassland ecosystems in Africa in relation to mammalian evolution and the origin of the genus Homo. *Palaeogeography, Palaeoclimatology, Palaeoecology* 207(3-4):399-420.
- Bonnefille, R et al. High-resolution vegetation and climate change associated with Pliocene *Australopithecus afarensis*. *Proceedings of the National Academy of Sciences of the United States of America* 101 (2004): 12125-12129.
- Brown S et al. 2016. Identification of a new hominin bone from Denisova Cave, Siberia using collagen fingerprinting and mitochondrial DNA analysis." *Scientific reports* 6: 23559.
- Cerling TE et al. 1993. Expansion of C4 ecosystems as an indicator of global ecological change in the late Miocene. *Nature* 361: 344.
- Cerling TE et al. 2015. Dietary changes of large herbivores in the Turkana Basin, Kenya from 4 to 1 Ma. *Proceedings of the National Academy of Sciences* 112: 11467-11472.
- Faith JT & Behrensmeyer AK. 2006. Changing patterns of carnivore modification in a landscape bone assemblage, Amboseli Park, Kenya. *Journal of Archaeological Science* 33: 1718-1733.
- Fortelius M et al. 2006. Late Miocene and Pliocene large land mammals and climatic changes in Eurasia. *Palaeogeography, Palaeoclimatology, Palaeoecology* 238(1-4):219-227.
- Levin NE. 2015. Environment and Climate of Early Human Evolution. *Annual Review of Earth and Planetary Sciences* 43:405-429.
- Peppe D & Deino A. 2013. Dating Rocks and Fossils using Geologic Methods. *Nature Education* 4:1.
- Quade J & Levin N. 2013. East African hominid paleoecology: Isotopic evidence from paleosols. *Early hominin paleoecology. University Press of Colorado, Boulder, Colorado*: 59-102.
- Rawlence NJ et al. 2014. Using palaeoenvironmental DNA to reconstruct past environments: progress and prospects. *Journal of Quaternary Science* 29: 610-626.
- Stewart JR & Stringer CB. 2012. Human evolution out of Africa: the role of refugia and climate change. *Science* 335: 1317-1321.
- Winder IC. 2014. The biogeography of the *Papio* baboons: a GIS-based analysis of range characteristics and variability. *Folia Primatologica* 85: 292-318.