Ant 274: Bones, Stones & Genomes
Fall 2015

Syllabus

*subject to change at instructor's discretion

Professor: Zachary Cofran
Lecture: 8321, T-Th 18-19:15 pm
Email: zachary.cofran@nu.edu.kz
Office: 8219
Office hours: Tues & Thurs 1-3 pm, and by appointment

We will examine the evidence of human evolution, beginning millions of years ago and up to the present day. Focusing on the fossil evidence, students will learn about the development and anatomy of what makes humans unique, as well as the comparative anatomy of other primates.

Course objectives
By the end of the semester, *hard-working* students will:
- understand what evolution is (and isn't) and how it works (and how it doesn't)
- learn how to identify and comprehend quality scientific articles
- learn to distinguish good science from 'pseudo' science (a.k.a. bullshit)
- learn how to set up and test a hypothesis
- appreciate the place of humans as another animal in nature

Textbooks & Readings
Conroy, GC and Pontzer H. 2012. *Reconstructing Human Origins*, 3rd edition. WW Norton: New York.

Additional readings will be posted to Moodle to supplement the textbook. These will be more focused on a given topic and will provide the subjects of in-class discussions.

Readings should be done before coming to class each week.

Grading
Participation = 20%

Pop quizzes over the current week's readings can happen at any time. Quizzes must be taken in class and cannot be made up. Your lowest score will be dropped from the final grade. Participation in laboratory assignments will also count toward your participation grade. See the **Technology clause** for information about **negative** participation points (below).

Lab assignments = 4 x 5% = 20%

Lab activities will introduce you to analyzing digital anatomical data and testing hypotheses.

Original research project & presentation = 20%

Using primary research articles and lab activities as a guide, you will: 1) develop a research question relating to human evolution, 2) propose a hypothesis that

addresses that question, 3) collect data and test your hypothesis, and 4) write up a short report. You must meet with me in person to discuss your research proposal!
- Project proposal meeting (26-30 October) = 5%
- Presentation (in class 24-26 November) = 15%

Midterm Exam = 20% (08 October)
Final Exam = 20% (Finals week)

Except for a few points on the exams, there will be no opportunities for extra credit

Grading scale

A	95-%100%	Excellent, exceeds the highest standards in the assignment or course
A-	90%-94.9%	Excellent; meets the highest standards for the assignment or course
B+	85%-89.9%	Very good; meets high standards for the assignment or course
B	80%-84.9%	Good; meets most of the standards for the assignment or course
B-	75%-79.9%	More than adequate; shows some reasonable command of the material
C+	70%-74.9%	Acceptable; meets basic standards for the assignment or course
C	65%-69.9%	Acceptable; meets some of the basic standards for the assignment or course
C-	60%-64.9%	Acceptable, while falling short of meeting basic standards in several ways
D+	55%-59.9%	Minimally acceptable
D	50%-54.9%	Minimally acceptable; lowest passing
F	0%-49.9%	Did not satisfy the basic requirements of the course

Late policy
Work turned in late will not be accepted. I do not grant extensions. You must be in attendance for quizzes and exams.

Academic Integrity
All work you submit must be your own. You may discuss assignments with your peers, but you may not turn in the same work. When you use references, other people's ideas, and especially other people's direct words, you absolutely must cite them. Failure to cite is plagiarism, which will result in your failure of the assignment. Plagiarism and other academic misconduct will be reported to the SHSS Disciplinary Committee for possibly further disciplinary action.

Attendance
Whether you attend each class is ultimately up to you, but you will do better if you come to class. Note that there will be quizzes every week and cannot be made up if missed. Keeping up with course material and due dates is ultimately your responsibility. Please do not waste either your or my time by sleeping in class (you will be asked to leave).

Technology
You will do better in the class if you pay attention during lecture; cell phones and other devices will distract you (and me) more than they will help you. Use of cell phones is prohibited: if you are found to be on your phone in class you will have to leave the

classroom and you will receive negative participation points (points previously earned will be lost). I may apply this policy to other devices if I see fit.

Schedule of topics* & assignments

*subject to change

18-20 August: Paleoanthropology
Readings: Su, 2012. What is it Like to be a Biological Anthropologist? A Field Paleontologist's Point of View. *Nature Education Knowledge* 3: 22 (http://bit.ly/13RSXzc)
Wong, 2014. Evolution rewritten. *Scientific American*
Wood, 2014. Welcome to the family. *Scientific American*
Pontzer, 2012. Overview of hominin evolution. *Nature Education Knowledge* 3:8 (http://bit.ly/homevol)

25-27 August: The human animal
Reading: Conroy & Pontzer chapters 1-2 and pages 270-278
Pollard, 2012. What makes us different? *Scientific American*.

01-03 September: Evolutionary theory
Reading: Conroy & Pontzer chapters 3-4

08 September: Doing science (project prep)
Thursday: Library resources
Readings: Zimmer, 2014. Why we can't rule out Bigfoot. *Nautilus* (http://bit.ly/czbigfoot)
Let's abandon significance tests. Blog post by James Wood on *The Mermaid's Tale* (http://bit.ly/1IUWzAR)

15-17 September: Planet of the apes (the Miocene)
Reading: Conroy & Pontzer chapters 5
Lab 1: Primate body mass

22-24 September: Hominin origins
Readings: Conroy & Pontzer chapter 7, pages 204-238
Ardipithecus special edition. *Science*.

29 September-01 October: Early *Australopithecus*
Lab 1 due 01 October at midnight
Lab 2: Stepping on toes
Readings: Conroy & Pontzer chapters 7 pages 238-255
Griffin and Richmond, 2010. Joint orientation and function in great ape and human proximal pedal phalanges. *American Journal of Physical Anthropology* 141:116-123.

06-08 October: Pliocene speciation

MIDTERM EXAM – in class Thursday 08 October
Reading: De Menocal, 2014. Climate Shocks. *Scientific American*.

*** Fall Break 12-16 October ***

20-22 October: South Africa
Lab 2 due 20 October at midnight
Readings: Conroy & Pontzer chapter 6
Constantino, 2013. The "robust" australopiths. *Nature Education Knowledge* 4:1 (http://bit.ly/1hFNR0d)

27-29 October: The genus *Homo*
Research Project proposal meetings (schedule with professor)
Lab 3: Dental variation
Reading: Conroy & Pontzer chapter 9
Villmoare et al., 2015. Early *Homo* at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia. *Science* 347:1352-1355.
Spoor et al., 2015. Reconstructed *Homo habilis* type OH 7 suggests deep-rooted species diversity early *Homo*

03-05 November: *Homo erectus*
Reading: Conroy & Pontzer chapter 10

10-12 November: A global species (ancient DNA)
Lab 3 due 12 November at midnight
Lab 4: Brain size evolution
Reading: Conroy & Pontzer chapter 11
Pääbo, 2015. The diverse origins of the human gene pool. *Nature Reviews Genetics* 16:313-314.

17-19 November: Rising Star Cave
Reading: to be announced …

24-26 November: Research project presentations

01-03 December: Human evolution today
Lab 4 due 01 December at midnight
No class Tuesday 01 December – 1st President's Day
Readings: Hawks, 2014. Still evolving (after all these years). *Scientific American*.
Allentoft et al., 2015. Population genomics of Bronze Age Eurasia. *Nature* 522: 167-172.
Stearns et al., 2010. Measuring selection in contemporary human populations. *Nature Reviews Genetics* 11:611-622.

FINAL EXAM (FINALS WEEK)