

# **Anthropology 207: Hominid Evolution**

## *Fall 2008*

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### **Course Description:**

The hominid fossil record provides direct evidence for the evolution of humans and our ancestors through the past 5-7 million years. This will provide an overview of human evolutionary history from the time of our last common ancestor with the living great apes up through the emergence of “modern” humans. Emphasis is placed on evolutionary mechanisms, and context is provided through an understanding of the pre-human primates. The human story begins with origins and the appearance of unique human features such as bipedality, the loss of cutting canines, the appearance of continual sexual receptivity, births requiring midwifery, and the development of complex social interactions. An early adaptive shift sets the stage for the subsequent evolution of intelligence, technology, and the changes in physical form that are the consequence of the unique feedback system involving cultural and biological change.

### **Texts:**

- Reconstructing Human Origins, 2005  
Glenn C. Conroy, W.W. Norton Press
- Primary literature (pdfs available via FirstClass)

### **Grading:**

10% Participation (in class and on First Class)  
30% Quizzes (4) – emphasis on the details of the fossil, archaeological and genetic record. Based on readings, lectures and supplemental information.  
30% Essays (4) – 1000 words or less. Concise argument supported with evidence  
30% Final – Essay based final, due by December 19

### **Course Goals:**

- Develop a familiarity with the basic outline of human evolution over the past 6-8 million years, including major evolutionary developments and important fossils sites and specimens
- Improved understanding of how the scientific process operates within the context of paleoanthropology and human evolution. How are questions asked and addressed? What constitutes knowledge of the past?
- Improved skill in writing concise, evidence based arguments
- Develop a comfort with constructive debate and respect for the opinions, views, and ways of approaching problems of other class members

### **First Class:**

The First Class site for this course will serve as the primary means of out-of-class communication as well as a storage location for course resources. An introduction to the site and its resources can be found on the main page of the conference.

### **Concerns:**

If you have any concerns regarding your ability to complete the assignments of the course or trouble understanding specific concepts, I am always available for consultation. In addition to my office hours I can be reached with regularity via e-mail (please only call my cell phone in case of emergency). Assistance is also available for students through the PForzheimer Learning and Teaching Center. All work in this class is subject to the Wellesley Honor Code. While students are encouraged to discuss the course materials and assignments both in and out of class, all of your work must reflect your own independent efforts. All assignments must be turned in on time. Unless approval is granted from Prof. Van Arsdale, no late assignments will be accepted. No extra credit will be available for this course.

## **SYLLABUS: (subject to change)**

### ***Week 1: What is Science***

Thursday, September 4 – First day of class

Reading:

- Conroy Preface, Chapters 2
- Tattersall (2008), “What’s so special about science?”. *Evolution and Educational Outreach* 1:36-41.
- Kell & Oliver (2004), “Here is the evidence, now what is the hypothesis?” *BioEssays* 26:99-105.

### ***Week 2: Evolution and the Fossil Record***

Reading:

- Conroy, Chapters 1 and 3
- White (2003), “Once were cannibals”. *Scientific American* 13:86-93
- Trinkaus (1985), “Cannibalism and burial at Krapina”. *Journal of Human Evolution* 14:203-216
- Russell (1987), “Mortuary practices at the Krapina Neandertal site”. *American Journal of Physical Anthropology* 72: 381-397.

***\*\*First Essay Assignment to be handed out in class (due online by 9/15 at 9:00am)***

### ***Week 3: Anatomy, Osteology and Classification***

Reading:

- Conroy, Chapter 4
- Tattersall (1986), “Species recognition in human paleontology”. *Journal of Human Evolution* 15:165-175
- Goodman et al. (1998), “Towards a phylogenetic classification of Primates based on DNA evidence complemented by fossil evidence”. *Molecular Phylogenetics and Evolution* 9:585-598.

#### ***Week 4: Early Primates and Miocene Apes***

Reading:

- Conroy, Chapter 5
- Begun (2006), “Planet of the Apes”. *Scientific American* 16:4-13.

**\*\*Basic Osteology Quiz (administered via FirstClass – must be completed by Friday 9/26 5:00 pm)**

#### ***Week 5: Hominid Origins and early Australopiths***

Reading:

- Conroy, Chapter 6
- Cela-Conde & Ayala (2003), “Genera of the Human Lineage”. *Proceedings of the National Academy of Science* 100:7684-7689.
- Wolpoff et al. & Brunet et al. response (2002), “Sahelanthropus or Sahelpithecus?”. *Nature* 419:581-582.

**\*\*Second Essay Assignment to be handed out in class (due online by 10/6 at 9:00am)**

#### ***Week 6: “Lucy” and “Mrs. Ples” – the Gracile Australopiths***

Reading:

- Conroy, Chapter 7
- Reno et al. (2003), “Sexual dimorphism in *Australopithecus afarensis* was similar to that of modern humans”. *Proceedings of the National Academy of Science* 100:9404-9409.
- Plavcan et al. (2005), “Sexual dimorphism in *Australopithecus afarensis* revisited: How strong is the case for a human-like pattern of dimorphism?” *Journal of Human Evolution* 48:313-320.
- Reno et al. (2005), “The case is unchanged and remains robust: *Australopithecus afarensis* exhibits only moderate skeletal dimorphism.” *Journal of Human Evolution* 49:279-288.

#### ***Week 7: The Robust Australopiths***

Monday October 13 (NO CLASS – FALL BREAK)

Reading: CATCH UP!!

#### ***Week 8: Australopithecine Ecology and Diet***

Reading:

- Conroy, Chapter 8
- Ungar (2000), “The dietary split between apes and the earliest human ancestors” in Humanity from African Naissance to Coming Millennia, P. Tobias (ed.), 337-352.
- Lee-Thorpe et al. (2001), “The hunters and hunted revisited”. *Journal of Human Evolution* 39:569-576.

**\*\*Australopithecine Quiz (administered via FirstClass – must be completed by Friday 10/24 5:00 pm)**

### ***Week 9: Origins of Homo***

Reading:

- Conroy, Chapter 9
- Leakey et al. (1964), “A new species of the genus *Homo* from Olduvai Gorge”. *Nature* 202:7-9.
- Gabunia et al. (2001), “Dmanisi and Dispersal”. *Evolutionary Anthropology* 10:158-170.

**\*\*Third Essay Assignment to be handed out in class (due online by 11/3 at 9:00am)**

### ***Week 10: Habilines and Erectines***

Reading:

- Wood & Collard (2000), “Evolving interpretations of *Homo*”, in Humanity from African Naissance to Coming Millennia, P. Tobias (ed.), 141-146.
- Lieberman et al. (1996), “Homoplasmy and early *Homo*”. *Journal of Human Evolution* 30:97-120.
- Miller (2000), “Craniofacial variation in *Homo habilis*”. *American Journal of Physical Anthropology* 112:108-128.

### ***Week 11: Hunting, Scavenging and Lower Pleistocene Ecology***

Reading:

- Conroy, Chapters 10 and 11
- Aiello & Wheeler (1995), “The expensive tissue hypothesis”. *Current Anthropology* 36:199-221
- Bunn & Ezzo (1993), “Hunting and scavenging by Plio-Pleistocene hominids”. *Journal of Archaeological Science* 20:365-298.

### ***Week 12: Regional Variation in the Pleistocene***

Reading:

- Anton (2003), “Natural history of *Homo erectus*”. *Yearbook of Physical Anthropology* 46:126-170.
- Rightmire (2000), “Human evolution in the Middle Pleistocene: The role of *Homo heidelbergensis*”. *Evolutionary Anthropology* 218-226.
- Arsuaga et al. (1997), “The Sima de los Huesos Crania”. *Journal of Human Evolution* 33:219-281.

**\*\*Early Homo Quiz (administered via FirstClass – must be completed by Friday 11/21 5:00 pm)**

### ***Week 13: Modern Human Origins, Part I***

Thursday, November 27 (NO CLASS – THANKSGIVING)

Reading:

- Conroy, Chapters 12 and 13
- Tattersall (2003), “Out of Africa, again and again”. *Scientific American* 38-45.
- Thorne & Wolpoff (2003), “The multiregional evolution of humans”. *Scientific American* 46-53.

**\*\*Fourth Essay Assignment to be handed out in class (due online by 12/1 at 9:00am)**

### ***Week 14: Modern Human Origins, Part II***

Reading:

- Garrigan & Hammer (2006), "Reconstructing human origins in the genomic era". *Nature Genetics Review* 7:669-680.
- D'errico (2003), "The invisible frontier: A multiple species model for the origins of behavioral modernity". *Evolutionary Anthropology* 188-202.

### ***Week 15: Post-Pleistocene Human Evolution***

Monday, December 8 (FINAL CLASS)

Reading:

- Hawks et al. (2007), "Recent acceleration of human adaptive evolution" *Proceedings of the National Academy of Science* 104:20753-20758.
- Larsen (2006), "The agricultural revolution as environmental catastrophe: Implications for health and lifestyle in the Holocene". *Quaternary International* 150:12-20.

***Modern Human Origins Quiz (administered via FirstClass – must be completed by Friday 12/10 5:00 pm)***

***\*\*FINAL EXAM – ESSAY FORMAT, SELF-SCHEDULED EXAM PERIOD\*\****