

**HUMAN EVOLUTION**  
ANT 4320, Spring Semester  
Tues, Thurs 12:30-2:00

Instructor: Gwendolyn Robbins  
Office: 401 Sanford Hall  
Office hrs: 11-12:30; 2-3:30; 10-11 Fri by email; by appointment, or anytime my door is open

This course is a comprehensive survey of hominin evolution. The archaeological and fossil record from the past 8 million years will be examined in detail, including paleoclimate research, “stones and bones”. In addition to covering the evidence for evolution, students will develop critical thinking skills about research paradigms, design, methodology, and interpretive frameworks. Lab exercises will allow students to examine fossil casts using a systems approach that considers structural-functional relationships, competing pressures in evolution, and even misapplication of evolutionary theory. After participating in this course, students will have learned basic human evolutionary anatomy, be familiar with key theoretical issues and debates in paleoanthropology, and will be prepared to enter graduate level training in biological anthropology. (PREREQUISITES: ANT 2230 Biological Anthropology).

**Required Texts:**

Ridley, M. "Evolution"

Weekly readings in Human Evolution Sourcebook as assigned by instructor (These begin in week 5 and YOU MUST HAVE A COPY OF THIS BOOK BY WEEK 4)

Ciochon, R and J. Fleagle "The Human Evolution Sourcebook" 2nd edition

**Grading:** Your grade in this class will be based on class participation (20%), a portfolio of 6/7 lab assignments and critiques of the other team (30%), and 2 take home essay exams (25% each).

**Class participation:** The success of an upper division seminar depends on all students coming to class prepared. This means you must read the materials before Tuesday's class. I will lecture on Tuesdays but I will randomly call on students in class to answer questions from the reading. Please bring whatever notes you need so you can refer to them to answer questions in class.

**Labs:** Students will create labs for a freshmen-level course on human evolution. Students will divide up into two teams the first week of class. That week, both teams will make labs on two different topics. After the first week, teams will be responsible for making labs every other week and the alternating week, students will implement the lab the other team made (providing a detailed summary of the implementation of the lab, 2 positive and 2 negative points, and a grade for it). The lab assignments you create can take whatever form you like, as long as they accurately represent the fossil record, theoretical issues, and debates in paleoanthropology. You should read the assigned reading BEFORE coming to lab or you will not be able to complete the assignment properly.

**Written exams:** These short papers will be a critical examination of the readings in evolutionary theory and the fossil record, and paradigms in hominin evolution. The papers will be around 10 pages and students will be given questions covering topics covered in readings and class lectures. We will discuss the papers further as the term proceeds.

**Academic Integrity Code**

Appalachian State University's Academic Integrity Code is designed to create an atmosphere of trust, respect, fairness, honesty, and responsibility. The Academic Integrity Code outlines “user-friendly” procedures and mechanisms for resolving alleged violations of academic integrity. The Academic

Integrity Code is the result of cooperation among Appalachian's faculty, students, and administrators, and promotes a campus dialogue about academic integrity. All members of the Appalachian State University community are responsible for promoting an ethical learning environment.

Students attending Appalachian State University agree to abide by the following Code

- Students will not lie, cheat, or steal to gain academic advantage.
- Students will oppose every instance of academic dishonesty.

Students shall agree to abide by the Academic Integrity Code when submitting the admission application.

### **Disability Services**

Appalachian State University is committed to making reasonable accommodations for individuals with documented qualifying disabilities in accordance with the Americans with Disabilities Act of 1990, and Section 504 of the Rehabilitation Act of 1973. If you have a disability and may need reasonable accommodations in order to have equal access to the University's courses, programs and activities, please contact the Office of Disability Services (828.262.3056 or [www.ods.appstate.edu](http://www.ods.appstate.edu)). Once registration is complete, individuals will meet with ODS staff to discuss eligibility and appropriate accommodations.

### **Attendance Policy**

It is the policy of Appalachian State University that class attendance is an important part of a student's educational experience. Students are expected to attend every meeting of their classes and are responsible for class attendance. Since attendance policies vary from professor to professor, students should refer to the course syllabus for detailed information. Regardless of what reasons there may be for absence, students are accountable for all academic activities, and faculty may require special work or tests to make up for the missed class or classes.

In addition, faculty members are required to make reasonable accommodations for students requesting to miss class due to the observance of religious holidays. All ASU students are allowed a minimum of two absences per year for religious observances. Up to two absences for such observances will be excused, without penalty to the student, provided that the student has informed the instructor by email. Notice must be given by the student to the instructor before the absence occurs and no later than three weeks after the start of the semester in which the absence(s) will occur. Arrangements will be made to make up work missed by these religious observances, without penalty to the student. For the purposes of this policy, ASU defines the term "religious observance" to include religious holidays, holy days, or similar observances associated with a student's faith that require absence from class.

Faculty, at their discretion, may include class attendance as a criterion in determining a student's final grade in the course. On the first day of class, faculty must inform students of their class attendance policy and the effect of that policy on their final grade; both policies must be clearly stated in the class syllabus. A student who does not attend a class during one of its first two meetings may, at the discretion of the academic department, lose her or his seat in that class. Further, if a class meets only one time per week - e.g., a laboratory or an evening class - the student must attend the FIRST meeting of that class or risk losing her or his seat.

### **Statement on Student Engagement with Courses**

In its mission statement, Appalachian State University aims at "providing undergraduate students a rigorous liberal education that emphasizes transferable skills and preparation for professional careers" as well as "maintaining a faculty whose members serve as excellent teachers and scholarly mentors for

their students.” Such rigor means that the foremost activity of Appalachian students is an intense engagement with their courses. In practical terms, students should expect to spend two to three hours of studying for every hour of class time. Hence, a fifteen hour academic load might reasonably require between 30 and 45 hours per week of out-of-class work.

### **TENTATIVE COURSE OUTLINE AND SCHEDULE**

Please note that there is flexibility (!) in this schedule and there may occasionally be some minor changes as I choose to include spontaneous class discussion, videos, etc.

#### **Week 1: Historical Background and Evolutionary Perspectives**

Read: Ridley Ch. 1 The rise of evolutionary biology; Ch. 2 Molecular and Mendelian Evolution

Lab: Scientific Method (Team A)

#### **Week 2: Pattern and Process in Evolution (Gwen in Thailand)**

Read: Ridley Ch. 3 The evidence for Evolution; Ch. 4 Natural Selection and Variation

Lab: Forces of Evolution (Team B)

#### **Week 3: Humans as Apes**

Read: Ridley Ch. 5 The Theory of Natural Selection; Ch. 6 Random events in population genetics

Lab: Forces of Evolution (Team A)

#### **Week 4: Trends in Primate Evolution and Behavioral Ecology**

Read: African Apes as Time Machines (Wrangham and Pilbeam); Ridley Ch. 7 Natural selection and random drift; Ch. 8 Two-locus and multi-locus population genetics

Lab: Primate Systematics (Team B)

#### **Week 5: The Context for Hominin Evolution**

Read: Molecular Anthropology and the Molecular Clock (Marks); Ridley Ch. 9 Quantitative genetics

Lab: Hominin origins (Team A)

#### **Week 6: Hominoid to Hominin**

Read and prepare a debate position for one of the following hominins: First Hominid from the Miocene (Senut); Late Miocene Homininds from the Middle

Awash, Ethiopia (Haile-Salassie); or A New Hominid from the Upper Miocene of Chad, Central Africa (Brunet)

and Ridley Ch. 10 Adaptive Explanations

Lab: Hominin Adaptations (Team B)

Week 7: The Australopithecines

Read: Inferring Hominoid and Early Hominid Phylogeny using Cranio-dental characters (Strait and Grine); Evolution of Human Walking (Lovejoy); Ridely Ch. 11

Units of selection

Lab: Hominin Adaptations (Team A)

Week 8: Origin of Homo

Read: Early Hominid Evolution and Ecological Change through the African Plio-Pleistocene (Reed); Ridely Ch. 12 Adaptations in sexual reproduction; Ch. 13 Species concepts and intraspecific variation

Midterm Exam due Thursday

Pliocene Hominins (Team B)

Week 9: Spring Break

Read: The History of the Genus Homo (Wood); Ridley Ch. 14 Speciation; Ch. 15 The reconstruction of phylogeny

Week 10: The Late Pliocene

Read: Berger et al. (2010) <http://www.sciencemag.org/site/extra/sediba/> and Aiello (2010) "Five years of Homo floresiensis"; Ridley Ch. 16 Classification and evolution

Lab: Australopithecines, Early Homo, and the morphology of LB1 (Team A)

Week 11: Exodus

Read: Pick 1 article in Part 5 of the Human Evolution Sourcebook and prepare to summarize that chapter as a group; Ridley Ch. 17 evolutionary biogeography

Lab: Biological and Behavioral Plasticity (Team B)

Week 12: Homo erectus

Easter break

Read: Spoor (2007) "Implications of new early Homo fossils from Ileret"; Aiello and Wells (2002) "Energetics and the evolution of the genus Homo"; Rosenberg and Trevathan (2003) "The evolution of human birth"

Lab: Pelvis, locomotion and birth (Team A)

Week 13: The Pleistocene

Read: Human Evolution in the Middle Pleistocene: the role of Homo heidelbergensis (Rightmire); The Atapuerca Sites and their Contribution to the Knowledge of Human Evolution in Europe (Bermudez de Castro, et al.); Ridely Ch.

19 Evolutionary genomics

Lab: Phylogeny and Ontogeny (Team B)

Week 14: Gwen in Memphis for SAA

Week 15: Neandertals

Read: Body Mass and Encephalization in Pleistocene Homo (Ruff et al.); pick one of the articles in Neandertals (Part VII) and prepare a debate position on their evolution and extinction; Ridley Ch. 22 Coevolution

Lab: Neandertal evolution and adaptations (Team A)

Week 16: Understanding human diversity

Read: pick one of the following sections 59, 62, 63, 64, 68, 72 and prepare to summarize for the class; Human Races: a genetic and evolutionary perspective; and Ridley Ch. 23 Extinction and radiation

Lab: Out of Africa: fossils, mtDNA, Y chromosomes, and/or genomics (Team B)

Final Exam period is Friday, May 11, 2012 from 9:00 AM -11:30 AM

(Papers and Portfolios are due)