

ANTHROPOLOGY 161
HUMAN ORIGINS: AN INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY

BULLETIN INFORMATION

ANTH 161: Human Origins: An Introduction to Biological Anthropology (4 credit hours)

Course Description:

An introduction to the science of biological anthropology, a subfield of anthropology that emphasizes a focus on humanity and its origin from a biological perspective, employing laboratory components to complement and reinforce lecture materials

SAMPLE COURSE OVERVIEW

The course is an introduction to the science of biological anthropology. Biological anthropology is a subfield of anthropology that emphasizes a focus on humanity and its origin from a biological perspective. As a subfield of Anthropology, biological anthropology recognizes the complex interaction of biology and culture in the evolutionary development of the human species. In this class we study the basic principles, concepts and mechanisms of evolution and the evolutionary history of humankind from primate beginnings to anatomically and behaviorally modern *Homo sapiens*. The course is divided into 3 sections:

- 1) The science of anthropology and the models and mechanisms of human evolution;
- 2) Modern human variation and adaptation, and our relationships to non-human primates; and
- 3) The origin, development, and dispersal of humans using evidence from the fossil record (paleoanthropology) and archaeological remains. Along the way, it illustrates the ways in which anthropologists learn about the past and how we can use our knowledge of the past to understand the present.

The most basic goal of this course is to become better informed as to how scientific anthropological approaches contribute to our understanding of what it means to be a member of the human species. We are a product of our past as well as present, and this course hopes to show how understanding our biological and cultural history (through the theory and method of the science of anthropology) can provide us with a better understanding of humanity.

ITEMIZED LEARNING OUTCOMES

Upon successful completion of Anthropology 161, students will be able to:

1. Understand basic anthropological and biological terminology as it relates to non-human primate studies, human origins and evolution, and the development of human culture
2. Understand the models and mechanisms for human biological change
3. Develop an understanding of the diversity of non-human primates and their behavior using direct observation of living primates

4. Appreciate the importance of understanding non-human primate behavior for understanding ancestral humans
5. Demonstrate a basic understanding of current issues and debates surrounding the origins of modern humans
6. Develop and demonstrate a clear understanding of current scientific knowledge about the human lineage
7. Understand the relationship between human biology and culture
8. Understand the fact that race is a cultural construct, and not a biological characteristic
9. Explore ethical issues surrounding the study of humans and non-human primates from a biological perspective
10. Employ technologies to identify and characterize the distinct patterns of human tool use versus carnivore predation
11. Use biological anthropological methods and theories to identify, measure, and analyze primate and human variation in the past and present
12. Develop and test hypotheses to interpret fossil and modern primate and hominid skeletal material.

SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS

1. Marks, Jonathan 2011. *The Alternative Introduction to Biological Anthropology* New York, NY, Oxford University Press.
2. Assigned readings for discussion (Available on Blackboard).

SAMPLE DESCRIPTION OF EXPECTATIONS FOR ASSIGNMENTS AND/OR EXAMS

Class content will be presented through lecture, films, debates, discussion, projects, and hands-on labs. There will be a basic text and additional readings to supplement the text and for classroom discussion. **NOTE:** You are required to go to Riverbanks Zoo. This will require the students to purchase a ticket themselves.

1. Course organization:

Beginning with a brief presentation of the origin and elaboration of the idea of evolutionary change and the discovery of its mechanisms, we will investigate basic evolutionary principles including natural selection, genetics, contemporary human variation, and change (first third of the course). We will then investigate the variety of non-human primates and their behaviors, and how they give us insights into the possible behaviors of our hominid ancestors (second third of the course). Finally we will explore the fossil record of the hominids (our ancestors and their relations) and hominid evolutionary history and dispersal (final third of the course).

2. Evaluation

This class includes of a variety of means to evaluate student performance and mastery of the material. There are three projects throughout the course of the semester.

Project 1: Students will employ the terminology of the study of heredity and Mendelian genetics and work through a series of problems that demonstrate basic Mendelian principles at the individual and population level.

Project 2: Students will employ the field observation techniques of primatology to study the variation and behaviors of a variety of living primate species. Students will compare observation techniques to record and interpret primate behavior.

Project 3: Students will compile a phylogeny of hominine ancestors and record key variables in order to recognize and understand processes of evolutionary change in our human lineage.

- There will be **three exams**, and **three quizzes** administered during the lecture portion of the class. These exams and quizzes will evaluate student comprehension of the key aspects of biological anthropology method and theory that have been explored in the prior weeks' lectures, labs, and projects.
- The **lab component** will include **14 labs**, which consist of lab reports, genetic exercises, discussions of research methodology, primate anatomy, the study of modern and ancestral human skeletal anatomy, and field observation of primates. Grading will be based upon the exams, quizzes, video/film review sheets, projects, and laboratory quizzes, exercises and participation.

3. Portfolios

We want to also remind you that every anthropology undergraduate major and graduate student is now encouraged to keep an **electronic portfolio** of your course papers and other work that reflects your scholarship in Anthropology at USC. You will be encouraged to turn in this e-portfolio upon graduation. It will be kept confidential on a dedicated server in the department, and will make it much more convenient for you and the faculty in the future when you contact the department to request letters of recommendation.

SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS

Week 1: Thinking about the past: how we understand “deep time”, the origins of evolutionary thought (Chapters 1 and 2)

Week 2: Overview of Darwinian concepts of natural selection (Chapter 3)

Week 3: The problem of heredity, Mendelian genetics, genes and equilibrium (Chapters 4-5)

Project 1

Week 4: Modern human variation (Chapter 13)

Week 5: Primates, taxonomy, biogeography, characteristics (Chapter 6 and 7)

- **Project 2** (requires zoo admission)

Week 6: Living primates, primate behavior (Chapter 8)

First Midterm covering materials presented in weeks 1-4 (including labs and projects)

Week 7: Primate models for human behavior (Chapter 9)

Week 8: Fossil primates (Chapter 10)

Week 9: Emergence of the Human Lineage: Primate evolution, first hominids (Chapter 11)
– **Project 3**

Week 10: The Human Lineage Evolves: *Australopithecus*, bipedalism, homine adaptive radiation

Week 11: Origin of the genus *Homo* (Chapter 12)
Second Midterm covering materials presented in weeks 5-10 (including labs and projects)

Week 12: “*Homo erectus*”—one or more species of *Homo* at the Plio-Pleistocene transition

Week 13: Evolution and the Nature of archaic *Homo sapiens* and Neandertals

Week 14/15: New Ideas, New Worlds—the appearance of behaviorally modern *Homo sapiens*

Final Exam: cumulative, with emphasis on materials covered in weeks 11-14 (including labs and projects) **TIME AND DATE ACCORDING TO UNIVERSITY EXAM SCHEDULE**

LABORATORY SECTION WEEKLY TOPICS

Week 1: The Scientific Method and Anthropology: Class discussion identifying elements of humanity. Application of scientific principles to the study of human evolution and variation

Week 2: Darwinian Natural Selection and Mendelian Genetics: Worksheet problems and hands-on lab exercises on measurement and calculation of simple monogenetic traits (e.g. PTC tasting, attached earlobes, etc.).

Week 3: Population Genetics and Hardy Weinberg: Worksheet problems and computer modeling (antibiotic resistance, genetic drift, founder effect, etc.).

Week 4: Introduction to the Human Skeleton: Instruction in skeletal anatomy (key elements, their identification, and processes of bone formation). Hands-on bone identification

Week 5: Primate Behavior: In-class instruction in observation techniques and on-site observations of behavior of primates at Riverbanks Zoo using different observation techniques. Analysis includes comparison of efficacy of different techniques.

Week 6: Primate Anatomy: Hands-on measurement and comparisons of key features of comparative anatomy relevant to mammalian-primate differences, and relationships among primate sub-taxa.

Week 7: Human Anthropometry: Methodological approaches to the study of modern biological variation in human populations. Includes hands-on calculations of demographic parameters, and instruction in anthropometric techniques. Anthropometry used to calculate body proportions, growth trends, Body Mass Index, percent body fat, and other relevant measures and discussion of what these data mean, and how they are used (in public health discussions, for example).

Week 8: Archaeological Principles and Dating Techniques: Exercises on key principles and methodological techniques of stratigraphy, seriation, relative and absolute (chronometric) dating, taphonomy, fauna and flora analyses.

Week 9: Primate Evolution: Investigation of the fossil data that permits developing an understanding of primate evolution from the earliest primates in the Paleocene and Eocene, through to the evolution of apes in the Miocene. Hands-on identification of primate characteristics on a series of fossil casts.

Week 10: Early Hominid Evolution: Investigation of the environmental and biological context of the earliest hominid ancestors including the recent publication of *Ardipithecus ramidus*.

Week 11: Lithic Tools, Taphonomy: Hands-on demonstrations of stages in stone tool manufacture and key elements in tool identification. Experimental analyses of stone tool use wear using microscopes.

Week 12-13: Fossil Hominid Labs (Identification/Classification, Diet, Locomotion) (3 weeks): Identification and measurement of key features in fossil hominids (focusing on skull, dentition, post-cranial features associated with bipedalism) using digital and fossil materials. Creation of phylogenetic relationships using fossil data. Comparison of genus *Homo* fossils to understand the evolutionary processes leading to modern *Homo sapiens*. Investigation of *Homo floresiensis* and the scientific method revisited.

Week 14: Human Migration: Investigation of the current theories for the peopling of the New Guinea-Australian continental mass, and the Americas, focusing on the archaeological evidence and its evaluation.