ANTH 1: INTRODUCTION TO BIOLOGICAL ANTHROPOLOGY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
Units:	4
Hours:	4 lecture per week (48 total per quarter)
Advisory:	Not open to students with credit in ANTH 1H.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Area 5: Natural Sciences w/ Lab
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Utilize a discipline-specific vocabulary to discuss the cornerstones of physical anthropology (genetics, primatology, the fossil record, and modern human variation).
- Adopt the framework of Evolutionary Theory to evaluate biological change over time.
- Evaluate the impact of human evolution on past, present, and future environments.
- Explain ancient and modern human variation in biocultural terms.
- Define scientific inquiry and its methods

Description

Survey and investigation of the basic processes of evolution and their application to the development of modern humans. Impact of natural selection and genetics on development of new species. Evolutionary processes behind the physical and behavioral development of primates. History of the human lineage by reconstructing the fossil record, using investigations by paleoanthropologists, geologists, biologists, and archaeologists. Relationship between contemporary biology and behavior, facilitating an understanding of the effect of them upon future humankind.

Course Objectives

The student will be able to:

1. Explain biological evolution by discussing the field of anthropology, the scientific method, and the history behind evolutionary theory.
2. Compare Darwinian theory of biological evolution and Mendelian inheritance, including basic genetics, taxonomy, and speciation.
3. Explain the field of primatology by identifying various non-human primates and describing their physical and behavioral characteristics, including a focus on behavioral ecology and social structures.
4. Assess current models for human origins by defining ancestral hominids and explaining important elements of paleoanthropology, including dating methods, experimental archaeology, specific fossil evidence, and general patterns of changing morphology and behavior.
5. Link behavior and biology today by discussing human variation, modern race concepts, basic population genetics, examples of biocultural evolution, and potential future evolutionary trends.

Course Content

1. Background to biological evolution
   a. Major subfields of anthropology
      i. Biological or physical anthropology
      ii. Archaeology
      iii. Cultural anthropology
      iv. Linguistics
   b. Major research areas within physical/biological anthropology
      i. Primatology
      ii. Paleoanthropology
      iii. Sociobiology
      iv. Forensics
   c. Anthropological perspective
   d. Scientific method and its application to physical anthropology
   e. Historical advances in the natural sciences, resulting in part from the age of discovery and exploration
      i. Advances in geology (Lyell)
      ii. Advances in biological classification (Linnaeus)
      iii. Advances in population studies (Malthus)
      iv. European ethnocentric and racist world views, particularly the notions of fixity of species and a general sense of stasis
2. Darwin's theory of biological evolution and Mendelian inheritance, including basic genetics, taxonomy, and speciation
   a. Historical development of the Darwinian theory of natural selection
      i. Contributions of 18th and 19th century scientists to evolutionary theory (Lamark, Wallace, Erasmus Darwin)
      ii. Process by which Darwin used these earlier ideas to formulate his three postulates of natural selection
   b. Theory of natural selection
      i. Variation in species and how natural selection acts on this variation through differential reproductive success to alter species
      ii. Galapagos finches and recent studies by Rosemary and Peter Grant
      iii. Shortcomings of Darwin's explanation of evolution in reference to 19th century genetics and theories of inheritance (blending)
   c. Basic principles of Mendelian inheritance
      i. Mendel's pea experiments
      ii. Concepts of dominant, recessive, and codominant alleles
      iii. Principles of segregation and independent assortment
      iv. Using the Punnett square
   d. Cellular structure and genetic structure of DNA and RNA
      i. Basic cell types and organelles including mitochondria and ribosomes
      ii. Nature of chromosomes and the concept of a gene
      iii. Compare and contrast mitosis with meiosis
      iv. Meiosis and the evolutionary process
      v. New frontiers of genetic research
   e. Mechanisms that produce genetic variation in populations

i. Mutation
ii. Genetic drift
iii. Gene flow

f. Concepts of population genetics using hemoglobin and malaria examples
g. Concepts of taxonomy
h. Homology and analogy
i. Concepts of genus and species
j. Speciation, including the roles of geographic isolation and natural selection
k. Geologic time scale
l. Major living mammalian groups
m. Contrast gradualism with punctuated equilibrium (S.J. Gould)

3. The field of primatology
   a. Ancestral mammalian traits and the evolutionary trends that define the order Primates
   b. Primate taxonomic classification, emphasizing the major taxa: suborder, superfamily, family, genus, and species
   c. Distinguishing features of prosimians, monkeys, apes, and humans
   d. Describe hominoid morphological traits and social structures
   e. Primate field studies
   f. Primate behavioral ecology
   g. Types of primate social interactions including grooming, dominance, and affiliative and aggressive behaviors
   h. Territoriality and resource acquisition
   i. Primate learned social behaviors and reproductive fitness
   j. Reproductive strategies (r-selected versus k-selected)
   k. Kin selection and Hamilton's rule
   l. Sexual selection
   m. Importance of the mother-infant bond in contributing to the normal social and psychological development of primate infants
   n. Primate communication and the evolution of language
   o. Nonhuman species' culture and tool use
   p. Between-group aggression in chimpanzees
   q. Female sexual selection in baboons
   r. Bonobo sexual relationships
4. Human origins and the important elements of paleoanthropology
   a. Define hominid, integrating the concept of biocultural evolution
   b. Paleoanthropology and the reconstruction of human biocultural evolution
   c. Data gathered from Olduvai Gorge and the example of how it is employed by paleoanthropology
   d. Various dating methods
   e. Experimental archaeology to interpret early hunting and tool use
   f. Different hypotheses for hominid origins
   g. Fossil evidence for primate origins
   h. Fossil evidence for anthropoid origins
   i. Fossil evidence for the origins and dispersal of the hominoids
   j. Major skeletal adaptations for full-time bipedalism
   k. Plio-Pleistocene hominids in chronological order
   l. Major early hominid fossil sites in Africa
   m. Classifying hominid species
   n. Dispersal of H. erectus out of Africa
   o. Fossil discoveries from Europe
   p. Early pre-modern Homo sapiens
   q. Evidence that Neandertals evolved in Europe
   r. Culture of Neandertals, including technology, settlement patterns, subsistence behaviors, and symbolic behaviors
   s. List the cultural contrasts between Neandertals and Upper Paleolithic humans
   t. Anatomically modern Homo sapiens
   u. Skeletal differences between anatomically modern H. sapiens and pre-modern H. sapiens
   v. Geographic distribution of H. sapiens and the Out of Africa model
   w. Climatic, technological, and subsistence changes in the Upper Paleolithic
5. Behavior and biology today
   a. Historical views of human variation
   b. Contrast modern race concepts and racist beliefs
      i. Highlight the work of Antenor Fermin, a Haitian anthropologist and scholar who first called attention to the equality of human races in the early 1900s
   c. Adaptive aspects of human genotypic and phenotypic variation
   d. Population genetics and the study of human diversity
   e. Hardy-Weinberg equilibrium formula
   f. Examples of human biocultural evolution
   g. Adaptive advantages of skin color related to levels of UV radiation and the incidence of rickets
   h. Human responses to heat, cold, and high altitude
   i. Bergmann's and Allen's rules
   j. Interactions between natural selection and human infectious diseases
   k. Nutritional effects on growth and development
   l. Human senescence
   m. The future of the Earth and the human species in light of the threat of overpopulation

Lab Content

Not applicable.

Special Facilities and/or Equipment

When taught as an online distance learning section, students and faculty need ongoing and continuous internet and email access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Homework: short answer and problem solving exercises emphasizing class discussion of results
Two map quizzes emphasizing geographic locations discussed in the class and text
Written project: short anthropology field project involving the comparative study of primate physiology and behavior at the zoo
Midterm exam: multiple choice; identification and short essay
Final exam: multiple choice; identification and short essay

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
Discussion
Cooperative learning exercises
Oral presentations
Electronic discussions/chat
Independent study
Demonstration

Representative Text(s) and Other Materials

Larsen, Clark Spencer. Essentials of Physical Anthropology, 5th ed.. 2022.

Shook, Beth, Katie Nelson, Kelsie Aguilera, and Lara Braff, editors. Explorations: An Open Invitation to Biological Anthropology. 2019. http://explorations.americananthro.org

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Two map quizzes covering geography important to class
2. Final paper with focus on scientific investigation of primates
3. Six homework assignments for critical thinking
4. All chapters in the textbooks are assigned
5. Exams

Discipline(s)

Anthropology