

# Lassen Community College Course Outline

## ANTH-1L Biological Anthropology lab

1.0 Units

### I. Catalog Description

This laboratory course is offered as an optional supplement to Introduction to Biological Anthropology either taken concurrently or in a subsequent term. Laboratory exercises are designed to introduce students to the scientific method and explore genetics, human variation, bio-cultural adaptations, human and non-human primate anatomy and behavior, the primate/hominin fossil record, and other resources to investigate processes that affect human evolution. This course has been approved for correspondence, hybrid and online delivery.

**Pre or Co-requisite:** concurrent enrollment in ANTH-1 (C-ID ANTH 110); or ANTH-1 Passed in a subsequent term

**Recommended Preparation:** Successful completion of ENGL105 or equivalent multiple measures placement.

Transfers to both UC/CSU CSU GE Area: B3; IGETC Area 5C  
34 Contact Hours, 17 Homework Hours, 51 Total Hours  
Scheduled: Fall, Spring

### II. Coding Information

Repeatability: Not Repeatable, take 1 Time  
Grading Option: Graded or Pass/No Pass  
Credit Type: Credit - Degree Applicable  
TOP Code: 220200

### III. Course Objectives

#### A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Given a set of problems or questions regarding the nature of scientific inquiry, distinguish science from non-science, identify specific parts of the scientific method; apply basic scientific methods to reach a conclusion; and place specific persons, events, and broad ideas within their historical context.
2. Given a set of problems, questions, or being presented with a specific fossil or artifact: apply basic methods of genetics, paleontology, and taxonomy to solve a problem; evaluate and discuss potential interpretations of the data presented; identify important anatomical features or whole fossils and place them in proper taxonomic, geographic, and chronological contexts.
3. Apply the scientific method by stating a question; researching the topic; determining appropriate tests; performing tests; collecting, analyzing, and presenting data; and finally proposing new questions about the topic.
4. Correctly perform biological laboratory skills and display a habit of good laboratory practices.
5. Students will be assigned a project discussing examples and explanations of at least one of the following:
  - How fossils (or other anthropological specimens) are processed, curated, and maintained for various uses (especially for use in research).
  - Evolutionary mechanisms and their involvements in cell biology and genetics

as well as the relation of this to the rise of the primate lineages and proposed models of human evolution.

- Modern human variation and bio-cultural adaptations relating these to both biological evolution and cultural evolution
- Behavioral and anatomical differences of various non-human primates, and relate these differences to evolutionary processes and the proposed models of human evolution

## **B. Course Objectives**

Upon completion of this course the student will be able to:

1. Using a lab activity and/or materials, describe the structure and function of DNA and RNA and evaluate the process of protein synthesis.
2. Analyze evidence supporting the theory of evolution through natural selection.
3. Using a lab activity and/or materials, explain the mechanisms that produce and redistribute variation in gene frequencies in populations and relate this to proposed mechanisms of evolutionary processes
4. Utilizing the human skeletal materials, identify the elements of the human cranium and skeleton.
5. Explore established protocols for determining various aspects of human variation.
6. Identify anatomical and behavioral features of non-human primates.
7. Identify methodologies and reagents utilized to process organisms or fossilized specimens or those used in the caretaking of specimens in research, including dating techniques
8. Investigate the fields of human osteology, forensic, anthropometric, and anthroposcopic; including the methods used in each field and the relationships between these fields (how they are distinctive and how do they overlap)
9. Demonstrate basic mastery of human osteology, and the methods used in creating the biological profile (age, sex, stature, trauma, pathology and biological affinity)
10. Using the primate skeletal materials, correlate similarities in the earliest primate traits (Paleocene to the Oligocene) with generalized mammals and living primates; explore primates living during the Miocene.
11. Using hominin fossil materials, evaluate developments in biology, brain size, cultural adaptations, and migration in hominins
12. Using hominin fossil materials, compare and contrast bipedal skeletal characteristics with other locomotor strategies.
13. Using hominin fossil materials, evaluate developments in biology, brain size, cultural adaptations, and migration in hominins existing from greater than 5mya to early Homo, (comprising mostly the Australopithecines but including Sahelanthropus, Orrorin and Ardipithecus).
14. Investigate both human anatomical and genetic variation, and adaptations along with bio-cultural adaptations
15. Discuss the function and operation methods for a variety of instruments (compound microscope, dissecting microscope, metric scale, centrifuge, and spectrophotometer) and utilize laboratory lab ware (graduated cylinders, beakers, serological pipettes, etc.)
16. Describe examples of modern human variation and bio-cultural adaptations and relate these to both biological evolution and cultural evolution.

## **IV. Course Content**

The following topics may be included however, the order of presentation, relative emphasis, and the depth of treatment will depend on the preferences of the instructor.

#### Laboratory Content:

- A. Observing the Nature of scientific inquiry and applications of the scientific method
- B. Observing basic laboratory equipment and its utility in scientific inquiry
- C. Investigations of cell biology
- D. Observing and describing the structure and functions of DNA and RNA
- E. Investigating The principles of molecular, Mendelian and population genetics
- F. Demonstrating how human traits are inherited
- G. Observing Mechanisms of Evolution and outcomes of Evolutionary processes
- H. Analysis of the Fossil Records and relation to Macro evolutionary trends
- I. Evaluating taxonomic and cladistic approaches
- J. Analysis of primate evolution via fossil and genetic evidence
- K. Investigating human osteology, forensics and anthropometric methods
- L. Investigating trends in hominin anatomical and behavioral evolution
- M. Identifying anatomic and behavioral features of human vs non-human primates
- N. Compare morphology of primates and early hominids
- O. Describe the biological and behavioral adaptations of the genus *Homo*
- P. Identify defining features of anatomically modern humans
- Q. Analyzing modern human variation, current-day evolution and Bio-cultural adaptations.

## V. Assignments

### A. Appropriate Readings

Standard college level texts will be the primary sources of course readings. Additional readings from other sources (journal and magazine articles, internet websites, newspaper articles, etc.) will be assigned to augment or clarify issues in the primary text.

### B. Lab assignments

1. To successfully complete the course students must demonstrate an understanding of both the course content via completing mixed-format examinations (may include essays, short answer, multiple choice and/or demonstrations performed by the student).
2. Lab assignments may include, but are not limited to pre-labs, laboratory experiments, evaluation of fossils or example specimens, analysis of data, graph analysis or creation based on data or analysis of example experimental data.
3. Labs may also include the use of virtual labs or recordings of virtual labs paired with in-class discussions

### C. Writing Assignments

Writing assignments may include but are not limited to essay and short answer questions on mixed format examinations. Outside assignments (such as a book review; see below) will include a written segment.

### D. Expected Outside Assignments

1. Preparation for all laboratory exercises and studying for quizzes, exams and/or practical exams occurs outside of class
2. All text reading and note review is conducted outside of class. Students may

elect to do a research paper which must conform to college level work.

### **E. Specific Assignments that Demonstrate Critical Thinking**

The very nature of Physical Anthropology, as a discipline, requires that students constantly apply analytically critical thinking when dealing with the problems of interpretation of raw data as they apply to the evolutionary model. Examples of assignments that demonstrate critical thinking may include, but are not limited to:

1. Review of periodicals and newspapers
2. Review of laboratory experiment procedures and results
3. Designing of an independent laboratory experiment
4. Analyze and synthesize information presented throughout the course labs
5. Performance on laboratory exercises and write-ups of exercises
6. Written presentation of an independently developed laboratory experiment
7. Laboratory practical exams
8. Performance on mixed-format including essay questions asking students to critically analyze topics discussed in class.

## **VI. Methods of Evaluation**

### **Traditional Classroom Instruction**

The instructor will provide each student with a written course syllabus, indicating the evaluation procedures to be used. The final student grade will be based upon a combination of the following:

- A. Performance on mixed-format exams/practicals (multiple choice, true/false, short answer, and essay)

Examples of essay questions:

1. Explain the value of studying modern primate behavior to better understand the behavior of early hominids.
2. Describe the various clues that would lead an anthropologist to identify the sex and age of fossil remains, including the complete cranium with mandible, complete pelvis, clavicle, upper leg bone, bones of one arm and hand including wrist.
3. Compare and contrast '*Australopithecus afarensis*' and '*Homo erectus*'.
4. Discuss the significance of the East African fossils in the current understanding of hominid evolution.

- B. Class participation

- C. Performance of experimental procedures

- D. Performance of analytical procedures

- E. Evaluation of fossil evidence or other demonstrative specimens

### **Online Evaluation**

Same as face to face with all work being submitted online and the use of discussion forums for classroom participation.

### **Hybrid Evaluation**

A combination of traditional classroom and online evaluations will be used, such as (1) Traditional Classroom: exercises/assignments, objective examinations, and essay examinations and (2) Online delivery: exercise/assignments, online quizzes and exams, essay forum postings, and chat rooms. (3) Labsters or other online virtual labs or similar online educational materials may be utilized

### **Correspondence Evaluation**

Same as face to face with the exception of the desired use of proctored exams and exclusion of participation in classroom activities. Students will be expected to complete

written and reading assignments and activities equivalent to in-class assignments and activities. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student, however students are encouraged to communicate as often as desired.

## VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery     Correspondence Delivery

Hybrid Delivery                       Online Delivery

### Methods of Delivery

#### Traditional Classroom Instruction

Laboratory, discussion, audio/visual aids, demonstration, group exercises, guest speakers, lab, individualized programs and other as needed.

#### Correspondence Delivery

Assigned readings, instructor-generated typed handouts, typed lecture materials, exercises and assignments equal to face to face instructional delivery. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

#### Hybrid Delivery

A combination of traditional classroom and online instruction will be utilized. Each semester a minimum of 17 hours, or 1/3 of the lab hours, will be taught face-to face by the instructor and the remaining hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of exercises/assignments, lectures, visual aids, and practice exercises. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

#### Online Delivery

A variety of methods will be used, such as: research papers, asynchronous and synchronous (chat/forum) discussions, online quizzes and exams, posting to online website and email communications using the districts approved learning management system.

## VIII. Representative Texts and Supplies

Required text: K. Soluri & S. Agarwal., *Laboratory Manual and Workbook for Biological Anthropology; Edition 2<sup>nd</sup>*, 2019, W. W. Norton & Company. ISBN: 0393680681

## IX. Discipline/s Assignment

Anthropology, Biological Sciences

## X. Course Status

Current Status: Active

Original Approval Date: 05/17/2022

Board of Trustees Approval: 06/14/2022

Chancellor's Office Approval: 06/17/2022

Revised By:  
Curriculum/Academic Standards Committee Revision Date: