

Las Positas College
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Course Outline for ANTR 1L

BIOLOGICAL/PHYSICAL ANTHROPOLOGY LABORATORY

Effective: Spring 2014

I. CATALOG DESCRIPTION:

ANTR 1L — BIOLOGICAL/PHYSICAL ANTHROPOLOGY LABORATORY — 1.00 units

This laboratory course is offered as a 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, human and non-human primate anatomy and behavior, the primate/hominin fossil record and other resources to investigate processes that affect human evolution.

1.00 Units Lab

Prerequisite

ANTR 1 - Biological/Physical Anthropology
(May be taken concurrently)

Strongly Recommended

- Eligibility for ENG 1A -

Grading Methods:

Letter or P/NP

Discipline:

- Anthropology

| | <u>MIN</u> |
|---------------------|------------|
| Lab Hours: | 54.00 |
| Total Hours: | 54.00 |

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

- A. ANTR1

Before entering this course, it is strongly recommended that the student should be able to:

- A. -Eligibility for ENG 1A

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

- Apply the scientific method.
- Identify the outcomes of evolutionary processes.
- Describe structure and function of DNA and RNA.
- Demonstrate how human traits are inherited.
- Identify anatomical and behavioral features of non-human primates.
- Compare the morphology of primates and early hominins.
- Describe the biological and behavioral adaptations of the genus Homo.
- Identify defining features of anatomically modern humans.

V. CONTENT:

- Nature of scientific inquiry and the scientific method
- Molecular, Mendelian and population genetics
- Mechanisms of evolution
- Comparative primate taxonomy, anatomy and behavior
- The nature of the fossil record including dating techniques
- Fossil and genetic evidence of human evolution
- Biocultural adaptations and modern human variation

VI. METHODS OF INSTRUCTION:

- A. **Observation and Demonstration** - Applicable laboratory skills.
- B. **Demonstration** - Skills and process demonstrations.
- C. practice quizzes
- D. **Lecture** - Background and prep for lab.
- E. **Audio-visual Activity** - visual aids such as PowerPoint slides and web-based graphics
- F. **Lab** - Hands-on application of the scientific method.
- G. CD-ROM-based "virtual laboratory" exercises
- H. pen-and-paper exercises
 - I. models, fossils, and fossil casts
- J. **Classroom Activity** - hands-on experiment or lab exercise
- K. **Discussion** - Lab results debriefing.
- L. **Research** - internet-based research and references

VII. TYPICAL ASSIGNMENTS:

Laboratory activities include but are not limited to:

- A. Application of scientific methods
- B. Investigation of cell biology
- C. Examination of genetic traits
- D. Exploration of evolutionary mechanisms
- E. Investigation of human osteology, forensic and anthropometric methods
- F. Comparative behavioral and anatomical studies of non-human primates
- G. Comparative anatomy of fossil species
- H. Investigation of trends in hominin evolution
 - I. Investigation into modern human variation and bio-cultural adaptations

Examples include:

A. Pen-and-paper based lab work

1. Determine whether or not you can roll your tongue. What are the possible genotypes for this trait? Make a Punnett square to help you answer the following questions:

a. Assume that you are heterozygous for tongue-rolling. If you have children with another heterozygote, what are their possible genotypes? What are their possible phenotypes? Use the letters R and r to represent the dominant and recessive alleles.

b. If you cannot roll your tongue and you have children with someone who is heterozygous for tongue-rolling, what are the possible genotypes and phenotypes for your children?

2. Use the dental eruption chart to determine the age of these individuals (chart and photos or models of crania provided).

3. If you were examining a number of mammal skeletons, what characteristics would you use to decide whether an individual was a primate or not?

a. Circle the characteristics you would use:

1. fur 2. forward-facing eyes 3. relatively large brain 4. opposable thumbs 5. relatively small olfactory bulbs 6. mammary glands

b. Explain why you did not choose each of the answers you did not circle.

B. Laboratory exercises

1. In your lab, find and identify the following vertebrae, noting the features you used to make your identifications. a. atlas b. axis c. cervical vertebra from C3 - C7 d. thoracic vertebra e. lumbar vertebra f. sacrum g. coccyx

2. Using available cranial models, determine the continental ancestry of each. Explain in detail how you arrived at your conclusions.

3. Using the artifact reproductions provided, answer the following questions about lithic technology.

a. What would make you think that Oldowan tools were the product of human creativity, rather than a bunch of random rocks? What do you think they could be used for?

b. In what specific ways do Oldowan tools differ from Acheulian tools? What could Acheulian tools do that Oldowan tools could not?

C. CD-ROM or web-based exercises.

1. Complete lab number 6 in John Kappelman's Virtual Laboratories for Physical Anthropology. Submit an essay summarizing the exercise and what you learned from it.

2. Go to the Dolan DNA Learning Center's webpage of biology animations at <http://www.dnalc.org/ddnalc/resources/animations.html> and view the Chromosome 11 flyover. Submit an essay summarizing the exercise and what you learned from it.

D. Field trips for captive primate behavioral observations

1. For at least four species of primate at the zoo, answer the following questions:

a. Give both the common name and the scientific name for the species. b. To which suborder does the species belong? How can you tell? c. To what infraorder does the species belong? d. To which superfamily does the species belong? e. In what kind of habitat is the species found? f. Where is the species found geographically? g. What is the primate's body size?

h. Compare the primate's hands to human hands. i. What is the primate's mode of locomotion? j. Does the primate have a tail? If so, how is it used? How long is it in relation to the primate's body? k. How many individuals are in the exhibit? What are their ages and sexes? l. Are they sexually dimorphic? m. Describe the behaviors you observe.

E. In-lab practice quizzes (open book).

1. What are the components of the axial skeleton?
2. What are the five kinds of vertebrae?
3. Name a feature that differentiates all seven cervical vertebrae from the other vertebrae.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Research Projects
4. Papers
5. Projects
6. Field Trips
7. Group Projects
8. Class Work
9. Lab Activities

B. **Frequency**

1. Laboratory exercises; weekly
2. Laboratory reports; weekly
3. Laboratory practical exams; at least two
4. In-lab practice quizzes; at the instructor's discretion
5. Midterm and final examinations

IX. TYPICAL TEXTS:

1. Walker, Suzanne E. *Exploring Physical Anthropology: A Lab Manual and Workbook*. 2 ed., Morton Publishing Company, 2010.
2. Kappleman, John *Virtual Laboratories for Physical Anthropology*. 4 ed., Thompson/Wadsworth, 2010.
3. C. Whitehead, Paul F., Sacco, William K., and Hochgraf, Susan B. *A Photographic Atlas for Physical Anthropology*, Morton Publishing Company, 2007.
4. France, Diance *Lab Manual and Workbook for Physical Anthropology*. 7 ed., Wadsworth, 2010.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. lab textbook
- B. lecture textbook/workbook
- C. LPC computer access and/or print card
- D. computer/Internet access at home or ability to access the LPC on-campus facilities