

Environmental Archaeology

Draft 300-level methods/lab course

The evolutionary history of both humans and our hominid ancestors has been fundamentally shaped by our surrounding environments. Environmental archaeology explores the dynamics of human-environmental interactions, with an emphasis on identifying the ways people were affected by, adapted to, or even altered their surroundings. In this course, we will explore the main methods employed by environmental archaeologists as well as survey environmental archaeological theory and case studies. Throughout this course, students will learn the introductory techniques of the main environmental archaeological methods (geoarchaeology, zooarchaeology, paleoethnobotany, GIS, isotopic analysis), how to interpret those data, how to use environmental archaeological data in reports and writing, and how to contextualize these methodologies within archaeological discourse and contemporary dialogue. Some questions we will explore throughout the semester include: How have people responded to climatic events or other challenging environmental conditions in the past? How did changing climates affect the development of human societies globally? What can we learn from our forebears, and what is the future of our cultural heritage given our current climate catastrophe?

Learning Outcomes

Through participation in this course students should gain skills and an understanding of the following:

- Recognize common geoarchaeological contexts, anthropogenic soils, and understand and interpret soil profiles
- Understand the role of paleoethnobotany in subsistence studies and how to process soil samples for paleoethnobotanical remains
- Read and quantify zooarchaeological data including MNI and NISP and recognize broad faunal categories
- Know the basics of computer-based map-making including main data types
- Have the basic skillsets to assist the above analyses
- Quantitatively understand environmental archaeological data in CRM reports and academic articles

Textbook

Dincauze, D.F., 2001. Environmental Archaeology, principles and practice. Cambridge University Press, Cambridge

Additional readings and case studies will be assigned.

Class Structure

Weekly meetings will include one lecture-based class, one discussion-based class, and one lab emphasizing practical skills. Students are expected to read the required chapter before lecture

classes. All students are required to read the case study, though each week a group of students will prepare questions to lead our class discussion.

Assessment

- 30% Discussion Preparation
- 30% Lab Exercises
- 10% Lab Notebook
- 30% Final report

Discussion Preparation – Throughout the semester, groups of students will be required to prepare a 2-page summary of the discussion paper for class. Students must summarize the piece, indicate how they think the piece contributes to our collective understanding of human-environment interactions, how it deepens our knowledge of what happened in the past, and include 2-3 discussion questions for class. Students are expected to prepare in this way for 3 class discussions.

Lab Exercises – There will be 4 lab assignments throughout the semester (on each for geoarchaeology, paleoethnobotany, zooarchaeology, and GIS). These lab exercises will be guided activities that take place within the lab. The instructor will be present to help with these assignments.

Lab Notebook – For lab periods where we do not have a graded exercise, students are expected to keep notes on methods and lab practices. You are also encouraged to take notes for class within these notebooks, as this resource will then help you in your future studies or career. Notebooks will be returned at the end of the semester.

Final report – Students will have a choice of a mini-analysis that they must complete and write up in the IMRaD format. You can choose from a geoarchaeological, paleoethnobotanical, faunal, or GIS assignment. All materials will be provided to you within the lab space, and lab time can be used to complete the analysis. This analysis will be written up in a report format, with a brief discussion incorporating reflections and interpretations from an archaeological perspective. Please be sure to address what your results mean within a larger cultural context! Final papers should be 7-10 pages in length.

Weekly Schedule

Week 1 – Introduction to Environmental Anthropology

Lecture: Environmental archaeological concepts, archaeology as human ecology

Discussion: Tips for success, Archaeology with a capital “S”

Lab: Basic lab safety

Week 2 – Geoarchaeology Part I

Lecture: Geomorphology and intro to soil profiles

Discussion: Landform reconstruction, Laetoli, Tanzania

Lab: Field trip to look at road cut/soil profiles

Week 3 – Geoarchaeology Part II

Lecture: Sediments and soils

Discussion: Terra praeta, Amazonia

Lab: Soil color, texture, and basic description

Week 4 – Paleoethnobotany Part I

Lecture: Paleoethnobotanical methods and goals

Discussion: Rice domestication, Southeast Asia

Lab: Flotation and introduction to microscopes

Week 5 – Paleoethnobotany Part II

Lecture: Quantifying paleoethnobotanical remains

Discussion: Incidental versus anthropogenic plants in the Pacific Northwest

Lab: Basic macrobotanical identification

Week 6 – Zooarchaeology Part I

Lecture: Zooarchaeological concepts and methods

Discussion: Seasonality at Star Carr

Lab: Drawing bones exercise

Week 7 – Zooarchaeology Part II

Lecture: Quantifying zooarchaeological remains, taphonomy

Discussion: El Niño–Southern Oscillation and zooarch, Peru

Lab: Basic mammal vs aquatic vs avian identifications

Week 8 – GIS Part I

Lecture: Maps, geography, and space

Discussion: Eastern woodlands residential sites GIS analysis

Lab: Interactive, web-based GIS exercise

Week 9 – GIS Part II

Lecture: QGIS introduction and GIS terms

Discussion: Obsidian networks and transport

Lab: Creating a map in QGIS exercise

Week 10 – Isotopes

Lecture: Introduction to isotopes

Discussion: Isotopes, irrigation, and manuring in the European Neolithic

Lab: Review final projects, make-up lab time **All lab exercises due**

Week 11 – Putting it all together: Multiproxy Approaches

Lecture: Multiproxy archaeological examinations and paleoenvironmental reconstructions

Discussion: Great Basin Paleolithic coprolites

Lab: Final project time

Week 12 – Human behavioral ecology (HBE)

Lecture: Intro to HBE and optimal foraging theory concepts

Discussion: Faunal prey choice

Lab: Final project time

Week 13 – Niche construction theory (NCT)

Lecture: NCT and agriculture

Discussion: Aztec chinampas/floating garden ecosystems

Lab: Final project time

Week 14 – Biological and cultural adaptations to climate Part I

Lecture: Dual inheritance theory

Discussion: Lactose tolerance in Europe

Lab: Final project time **Lab notebooks due**

Week 15 – Biological and cultural adaptations to climate Part II

Lecture: Using the past to inform the future

Discussion: Mesopotamia agricultural salinity, adapting crops for climate change in Tibet

Lab: **Final projects due**