

# Geoarchaeology

*upper level undergraduate and graduate*

## Course Description

All archaeologists work within geological contexts. Whether we are conducting a survey, excavating a site, reconstructing paleoenvironments, or working with collections, archaeologists must understand the origins and depositions of sediments and as well as relationships between archaeological provenience, context, and matrix. Geoarchaeology is a multi-disciplinary field that draws on methods and techniques across geology, pedology, petrography, and chemistry to answer those archaeological questions. This course is designed for upper division undergraduate and graduate students with variable backgrounds in archaeological, earth, or soil sciences who are seeking to gain these geoarchaeological skills. This course is an overview into the various subfields of geomorphology and pedology, with particular focus on North American archaeological deposits, features, and common questions.

## Learning Outcomes

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

- Recognize common geomorphologic contexts and understand the role of environmental and anthropogenic processes on archaeological site formation
- Read and interpret soil profiles
- Interpret stratigraphic and bulk geoarchaeological data
- Understand applications of geophysical, geochemical, soil micromorphological, and isotopic techniques in geoarchaeology
- Understand which geoarchaeological techniques may be used to address archaeological questions

## Required Text

Karkanas, Panagiotis and Paul Goldberg

2019 Reconstructing Archaeological Sites: Understanding the Geoarchaeological Matrix. Wiley, Blackwell.

## *Optional*

Goldberg, Paul and Richard I. Macphail

2009 Practical and Theoretical Geoarchaeology. Blackwell Publishing.

Additional journal articles and chapters will be assigned and provided.

**Format**

Our first meeting of the week will be conducted in a lecture format covering material from the week's topic. Our second meeting of the week will either be used for lab exercises during the first half of the semester (Weeks 1-10) or for seminars during the second half of the semester (Weeks 11-15). Students are expected to read the required readings before class each week and come prepared to engage with class discussions.

**Undergraduate Assessment** Undergraduate students are expected to complete weekly lab exercises (10) and plan to participate in class discussion seminars (5). Students are expected to complete 2 online quizzes and 1 final, cumulative, take-home exam.

**Graduate Assessment** Graduate students are expected to complete weekly lab exercises (10) and plan to participate in class discussion seminars (5). Graduate students will also lead one seminar discussion period. Students are expected to complete 2 online quizzes and 1 final 10-15 page paper geoarchaeological literature review or analysis related to their research/thesis.

**Topic and Reading Schedule**

<b>Week/Topic</b>	<b>Reading</b>
Week 1 Intro to geoarchaeology	K&G Introduction, ch. 1
Week 2 Geomorphology, landscape formation	Butzer 1982 ch. 3
Week 3 Sediments	K&G ch. 2
Week 4 Soil formation factors and taxonomy	Buol ch. 3
Week 5 Stratigraphy	K&G ch. 4
Week 6 Anthropogenic deposits	K&G ch. 1
Week 7 Geoarch approaches to common features	K&G ch. 3
Week 8 Open vs closed sites	K&G ch. 5
Week 9 Basic field and lab techniques	K&G ch. 7.1-7.3
Week 10 Micromorphology & geochemistry	G&M ch. 16, Hunt & Speakman 2015
Week 11 Architecture	K&G ch. 6
Week 12 Agriculture	Woodson et al. 2015
Week 13 Sampling strategies and reporting	K&G ch. 7.4-7.5, G&M ch. 17
Week 14 Post-depositional processes and turbation	Waters 1992
Week 15 Integration & Quaternary reconstruction	Aiuvalsit 2020; Tolksdorf 2014