

**ANAR/SIO 167 Introduction to Geoarchaeology
Winter 2019**

Tuesday and Thursday 3:30 pm – 4:50 pm

LABORATORY: Friday 12 pm - 4 pm

Vaughn Hall 147

Prof. Isabel C. Rivera-Collazo

Office Hours: SvH1147 Mondays 1 - 2, or by appointment iriveracollazo@ucsd.edu

Course description:

As specialists in human timescales, archaeologists are trained to identify subtle details that are often imperceptible for other geoscientists. This course is designed to train archaeologists to identify the natural processes affecting the archaeological record, and geoscientists to identify the influence of human behavior over land surfaces. The course, which includes lectures, laboratory training and field observations, focuses on the articulation of sedimentology and human activity.

Course textbook:

- Goldberg, Paul and Richard Macphail. 2006. *Practical and Theoretical Geoarchaeology*. London: Blackwell Publishing. (Available as Electronic Resource in the UCSD Library).
- Gale, Stephen and Peter Hoare. 1991. *Quaternary sediments : petrographic methods for the study of unlithified rocks*. London: Belhaven Press; New York: Halsted Press.

Other important books that we will read from (all are in the library):

- Butzer, Karl. 1989. *Archaeology as Human Ecology: method and theory for a contextual approach*.
- Rapp, G. and C. Hill. 2006. *Geoarchaeology: the earth-science approach to archaeological investigation*.
- Stein, Julie and W. Farrand. 2001. *Sediments in archaeological context*.
- Reading, H.G. 1991. *Sedimentary environments: Processes, facies and stratigraphy*.
- Brown, A.G. 1997. *Alluvial Geoarchaeology. Floodplain Archaeology and Environmental Change*.
- Waters, M. 1992. *Principles of Geoarchaeology: A North American Perspective*.
- Wilson, L. (ed) 2011. *Human Interactions with the Geosphere. The Geoarchaeological Perspective*. Geological Society. Special Publication 352.

Objectives:

The student will:

- 1) Identify the physical characteristics of a selection of sedimentary depositional environments
- 2) Recognize the characteristics that identify natural and anthropogenic depositional environments through bulk sediment analyses
- 3) Describe sediment profiles and facies
- 4) Identify human influence over sedimentary environments
- 5) Train to conduct basic field sampling for geoarchaeological analysis
- 6) Train to conduct the basic laboratory tests to characterize sediments
- 7) Interpret data from analyzed sediment samples
- 8) Summarize the characteristics of one depositional environment (natural or anthropogenic)
- 9) Apply knowledge through the analysis of geoarchaeological case studies
- 10) Assess how the study of soils and sediment studies contributes to archaeological problem-solving both on-site and in the reconstruction of past environments.

Expectations:

This course is arranged as lectures and a weekly 4-hour lab. We will also have a field trip on a weekend. The students will be expected to attend to class, do all assigned readings and practicals, and participate actively.

Assignments

Grading will be based on the student's performance on the following assignments.

1. Attendance (100 points)
Attendance is one full mark towards the final grade. Points will be deducted for late arrival to class unless excused (see below – attendance and deadlines)
2. Assignments (no Mid-Term) (300 points):
 - a. Lead discussion in Class (50pts)
 - b. Oral presentation in Lab (50 points)
 - c. Final Lab Report (100 pts)
 - d. Essay on one Sedimentary Environment (100 pts)

In class participation

For the In Class Discussion, each student will lead the discussion on two articles to be read by all. Discussion will describe the goals of the article, identify field and lab methods, evaluate the data analysis and present the main take-away points. The student will also generate at least four questions to lead the conversation and stimulate the participation of all students in the class.

For the Oral Presentation, students will take 10 minutes to share with their peers their work during the quarter. They will describe their samples, present their results, share their analysis and present their data-based interpretation of the samples.

The In-Class discussion and the Oral Presentation in the Lab will be peer-assessed. The rubrics for assessment will be posted on TritonEd.

Final Lab Report

The Laboratory report will consist of a summary of the discussions held in the Laboratory Sessions, sediment descriptions, data from the laboratory analyses, and a preliminary interpretation of the depositional environment from which the samples originate. Maximum word-count: 1600 words.

Final Essay

The Final Essay will discuss the main research problems, challenges and methods pertaining to a particular depositional archaeological environment (e.g. alluvial, coastal, aeolian, etc) or type of site formation (desert campsite, tell, mound, midden, etc). The essay should be an overview of the characteristics of the sedimentary environment or site formation processes and a critical appraisal of two or more geoarchaeological case studies. Maximum word-count: 3600 words.

Policies

Total course grading

The final grading for this course will be measured out of a total of 400 points, divided in the following manner:

<u>Assignment</u>	<u>Points</u>
Attendance	100
In class/lab presentations	100
Final reports	200
TOTAL POINTS	400

Grading scale (%)

>100 = A+	77-79 = C+
94-99 = A	74-76 = C
90-93 = A-	70-73 = C-
87-89 = B+	67-69 = D+
84-86 = B	64-66 = D
80-83 = B-	61-63 = D-
	<60 = F

Late or missed deadlines (including exams)

The standard policy for this course is zero tolerance for missed deadlines. **Work submitted after the deadline will receive zero points.**

The professor reserves the right to accept late assignments in exceptional cases. If the student has a situation affecting his or her ability to comply with a deadline (including exam attendance), he or she must discuss it with the professor **before the deadline**. If the situation is an emergency, an explanatory email requesting additional time must be received in the professor's inbox up to five minutes **before** the regular meeting time of the course or the assignment's due time. **If these conditions are not met, requests for time extension will not be considered.** Exceptions will only be made on the most unique situations where the student was absolutely and unforeseeably unable to notify as described above, the situation was informed via email as soon as the student was able to do it, and further arrangements were discussed in person with the professor.

Academic Integrity

Students are expected to complete the course in compliance with the highest standards of academic integrity. Honest effort is expected of everyone. By continuing their enrolment in this course, the student pledges to abide by UC San Diego's Integrity of Scholarship Agreement (<https://academicintegrity.ucsd.edu/forms/form-scholarship-agreement.html>) which reads as follows (some modifications were made to adjust it to the present course):

1. No student shall knowingly procure, provide, or accept any materials that contain questions or answers to any examination or assignment to be given at a subsequent time.
2. No student shall complete, in part or in total, any examination or assignment for another person.
3. No student shall knowingly allow any examination or assignment to be completed, in part or in total, for himself or herself by another person.
4. No student shall plagiarize or copy the work of another person and submit it as his or her own work.
5. No student shall employ aids excluded by the instructor in undertaking course work.
6. No student shall alter graded class assignments or examinations and then resubmit them for regrading.
7. No student shall submit substantially the same material in more than one course without prior authorization. A student acting in the capacity of an instructional assistant (IA), including but not limited to teaching assistants, readers, and tutors, has a special responsibility to safeguard the integrity of scholarship. In these roles the student functions as an apprentice instructor, under the tutelage of the responsible instructor. An IA shall equitably grade student work in the manner agreed upon with the course instructor. An IA shall not make any unauthorized material related to tests, exams, homeworks, etc. available to any student.
8. No student shall provide their assignments, in part or in total, to any other student in current or future classes of this course. No student shall procure or accept assignments from any other student from current or prior classes of this course.
9. For all group assignments, each member of the group is responsible for the academic integrity of the entire submission.
10. Each student is responsible for knowing and abiding by UCSD's Policies on Integrity of Scholarship (<http://academicintegrity.ucsd.edu/>) and Student Conduct (<https://students.ucsd.edu/sponsor/student-conduct/>). Any student violating these policies will earn an 'F' in the course and will be reported to the University for the violation.

Attendance

Attendance is part of the final grade of the course. Points will be deducted for unexcused absences and late arrivals. Students arriving late to class have to inform the professor at the end of the class or they will be marked as absent. All absences must be justified in person before class, or up to 5 minutes before the meeting via email in case of emergencies. Notification of absence only guarantees consideration for excuse, and will not entail automatic exemption from class attendance. The professor reserves the right to excuse the student from attendance.

Accommodations for Students with Disabilities

If you have a disability for which you are or may be requesting accommodations, please inform the professor as soon as possible, and contact Office for Students with Disabilities (<https://students.ucsd.edu/well-being/disability-services/>). You must have documentation from the Office before accommodations can be granted.

Course outline

- I. Introduction to Geoarchaeology**
 - a. Archaeology, Earth Sciences and the Anthropocene
 - b. Landscape building blocks
 - c. Basic geoarchaeology field and lab skills
- II. Depositional environments and archaeological case studies**
 - a. Aeolian environments
 - b. Alluvial environments
 - c. Coastal environments
 - d. Deep water and lakes
 - e. Glacial systems
 - f. Urban and anthropogenic systems
- III. In practice**
 - a. Bulk descriptions
 - b. Grain size analysis
 - c. Basic physical composition (pH, Organic Matter, Phosphates)
 - d. Magnetic susceptibility
 - e. Microartifact analysis.

Preliminary Schedule

The official course schedule will be posted in TritonEd and updated regularly. All students must refer to the course's webpage for information lectures, readings and assignments.

On...	we will discuss...	so, before class, please read...
1/8	Archaeology, Earth Sciences and the Anthropocene	Wilson Chapter 1 Waters Chapter 1
1/10	Sediments and environmental controls	Goldberg and Macphail Chapter 1 Stein and Farrand Chapter 1 Reading Chapter 2, section 2.1

1/15	Soils, Paleosols and Anthrosols	Goldberg and Macphail Chapter 3 Waters Chapter 2 Arroyo Kalin, M. 2014. Anthropogenic Sediments and Soils (pdf)
1/17	Stratigraphy facies	Goldberg and Macphail Chapter 2 Reading Chapter 2, Section 2.2 - 2.5
1/22	Aeolian sedimentology	Goldberg and Macphail Chapter 6 Waters Chapter 4 Reading Chapter 5 Stein and Farrand Chapter 3
1/24	Archaeology in aeolian settings	Case Studies TBD
1/29	Alluvial settings	Goldberg and Macphail Chapter 4 and 5 Reading Chapter 3 Waters Chapter 3 Stein and Farrand Chapters 3 and 4 Brown Book Part I
1/31	Floodplain Archaeology	Case Studies TBD
2/5	Coastal settings	Goldberg and Macphail Chapter 7 Waters Chapter 6 Stein and Farrand Chapter 6 Reading Chapter 6
2/7	Archaeology on coastal settings	Case Studies TBD
2/12	Wetlands, lakes and deep-water	Goldberg and Macphail Chapter 5 Waters Chapter 5 Stein and Farrand Chapter 5 Reading Chapter 4
2/14	Wetland and lake archaeology	Case Studies TBD
2/19	CATCH UP DAY	
2/21	Discussion	
2/26	Glacial settings and disturbance	Reading Chapter 11 Waters Chapters 5 and 7

2/28	Archaeology on glacial and disturbed settings settings	Case Studies TBD
3/5	Caves and Rockshelters	Goldberg and Macphail Chapter 8 Stein and Farrand Chapter 2 Waters Chapter 5
3/7	Humans as transport agents: Tells, Mounds and urban areas	Goldberg and Macphail chapters 10 and 11 Rosen Chapters 2, 3 and 4
3/12	Agriculture	Goldberg and Macphail Chapter 9 Brown Chapter 8
3/14	Human impacts on landscapes	Goldberg and Macphail Chapters 9 and 13 Brown Chapter 10

Laboratory Preliminary Schedule and Readings

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BOOK: Gale, Stephen and Peter Hoare. 1991. *Quaternary sediments : petrographic methods for the study of unlithified rocks*. London: Belhaven Press; New York: Halsted Press.

On...	we will...	On...	we will...
1/11	Intro to lab-work and initial sediment description and pH	1/17	Go to the beach to learn profile description and drawing
1/24	Map analysis (topo and geo) (Bring your laptops!)	1/31	Field Sampling Peñasquitos Ranch House (TBC)
2/17	Grain Size Analysis	2/14	OM LOI, Phosphates, Mag Susc
2/21	Microartefact Analysis	2/28	Catch up
3/7	Catch up	3/14	Oral Reports