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University of Utah

ZOOARCHAEOLOGY AND FIELD ECOLOGY

May 6-June 1, 2024

Course Description and Goals

Zooarchaeology is the study of animal remains from archaeological contexts to enhance our understanding of the long-standing and complex relationships between past people and animals. Analyses of archaeological vertebrate remains can address problems that range from past human subsistence strategies and paleoecology to paleoclimatic reconstruction. Addressing such issues involves first, the identification of the animal remains, and second, the interpretation of those remains. These two components of zooarchaeology are inextricably linked, and serve as the main goals of this hands-on, laboratory- and field-based course. The first goal of the course is to achieve competence in the recognition of different classes and orders of vertebrates; this includes the fragmentary remains of fishes, amphibians, reptiles, mammals, and birds. Laboratory activity is centered around the identification of archaeofaunal remains from selected localities—this summer we will be examining faunal material from selected sites in the Great Basin and Colorado Plateau. Additional experience in vertebrate identification will be achieved through experience in the preparation and curation of vertebrate skeletal specimens for an osteological comparative collection. The analytical and interpretive aspects of zooarchaeology will receive equal emphasis through assigned readings, lectures and case studies. Topics that will be covered include the nature of the archaeofaunal record, units of quantification, taphonomy, the selective utilization of animals, and foraging theory. To enhance the frame of reference in zooarchaeological analysis, extended background information on vertebrate ecology and natural history will be provided in lectures and reinforced through extensive field study and observations. Additional experience in both vertebrate identification and interpretation will be gained through the completion of a problem-oriented research project where students will develop and address a research problem through the analysis of a specific set of archaeological vertebrate materials. Further appreciation of the analytical and interpretive potential of archaeofaunal remains will be gained through attendance and participation at the Stanley J. Olsen Zooarchaeology Conference.

Readings**Required:**

Broughton, Jack. M., and Shawn D. Miller. 2016. *Zooarchaeology and Field Ecology: A Photographic Atlas*. University of Utah Press, Salt Lake City.

Dunn, J. L. and J. Alderfer. 2017. *National Geographic Field Guide to the Birds of North America, 7th. Ed.* National Geographic Society, Washington D.C.

Kays, R. W. and D. E. Wilson. 2009. *Mammals of North America, 2nd Ed.* Princeton University Press.

These books should be purchased in advance and brought to the field school (they are available from a number of vendors online, e.g., Amazon, Barnes and Noble).

We will also use selected readings that will be announced in class, posted on the course online (Canvas) page.

Optional:

For those wanting optional textbook style references, we recommend the following:

Gifford-Gonzalez, D. 2018. *An Introduction to Zooarchaeology*. Springer: New York.

Faith, J.T. and R. L. Lyman. 2019. *Paleozoology and Paleoenvironments: Fundamentals, Assumptions, Techniques*. Cambridge University Press: Cambridge, U.K.

Requirements and Grades

Time investment in the activity of bone identification is essential to learning, and students are expected to attend and actively participate in all lecture, lab and field activities. Comprehension of course content and objectives and the course grade will be assessed through two lab practical/exams, laboratory activity and bone identifications, a take-home essay exam, and the preparation and presentation of a research project. This latter effort should be linked directly to a body of faunal data that you have examined. This study should be empirically grounded applying the analytical skills of zooarchaeology. Each student will prepare a research proposal, and a written version of the completed project. Students will also deliver an oral presentation of their project at the Zooarchaeology Conference held at the end of the class.

Graduate students will be evaluated independently from undergraduates in this class. We also fully recognize the diversity of backgrounds and exposure to osteology and take this into account in our grading. A letter grade will be assigned weighting the exams, project, and lab and field effort and participation as follows:

Lab Practical/Exams (2)	100 pts.
Course Project (proposal, written paper, presentation)	100 pts.
Lab & Field Effort/Participation	100 pts.
Natural History Studies	50 pts.
Take Home Essay exam (due June 28)	<u>50 pts.</u>
Total	400 pts.

Schedule

<u>Zoom Lectures</u>	<u>Topics (Readings)</u>	<u>Laboratory</u>
May 6	The ZOFÉ Experience; History of Zooarchaeology; Classification Systems; Fishes: Taxonomy, Natural History, and Osteology; An Introduction to Local Communities (1. Broughton 2015; 2. Steele 2015)	Fishes B&M: Ch. 1-2
May 7	Modern Goals of Zooarchaeology; Amphibians & Reptiles: Taxonomy, Natural History, and Osteology (3. Driver 2011; 4. Wolverton 2012)	Amphibians/Reptiles B&M: Ch. 3-4
May 8	Great Basin Environmental and Human Prehistory; Mammals: Taxonomy, Natural History, and Osteology (5. Grayson 2006; 6. Broughton et al. 2008; 7. Elston et al. 2014)	Mammals B&M: Ch. 5
May 9	The Fremont and the Archaeology of Range Creek Canyon; Birds: Taxonomy, Natural History, and Osteology (8. Barlow 2002).	Birds B&M: Ch. 6.

May 10 Historic Zooarchaeology: Case Study—The Donner Party
(9. Dixon et al. 2010) **Lab Practical #1**

May 13 Arrive Salt Lake City: Depart for the Field Trip!!!

*** **May 13-19** *** *Archaeology and Natural History of the Eastern Great Basin and Colorado Plateau*. Key Sites: Homestead Cave, Lakeside Cave, Hogup Cave, Swallow Shelter, Donner Party Camp, Danger Cave, Bonneville Estates Rockshelter, Blue Lake, Fish Springs National Wildlife Refuge, The Old River Bed, Sudden Shelter, Cowboy Cave

<u>Range Creek Field Station</u>	<u>Topics (Readings)</u>	<u>Laboratory</u>
May 20	Criteria for Identifications; Cowboy Cave Faunas	Data Recording Taphonomy Lab
May 21	Quantification of Taxonomic and Skeletal Part Abundances; Foraging Theory and Zooarchaeology (10. Bayham 1979; 11. Nagaoka 2005)	Quantification Procedures Faunal Analysis
May 22	Statistics in Zooarchaeology; Structure and Organization of Scientific Papers	Faunal Analysis
May 23	Collection, Preparation, and Curation of Vertebrate Skeletons	Faunal Analysis Vertebrate Skel. Prep.
May 24	Lab Practical #2 ; Natural History Studies	Proposals
May 25	Pleistocene Megafaunal Extinctions; Proposals Due (12. Broughton and Weitzel 2018)	Proposals
May 26	Holocene El Niño and Human Patch Use in Baja California (13. Lyman 2017; 14. Hart et al. 2015; 15. Broughton et al. 2022)	Projects
May 27	Applied Zooarchaeology (16. Lyman 1996; 17. Lyman 2012)	Projects
May 28	Domestication Studies in Zooarchaeology (18. Perri et al. 2019; 19. Zeder 2012; 20. Taylor et al. 2023)	Horse Lab Projects
May 29	Natural History Studies (21. Crabtree 1990; 22. Vanderugtan 2015)	Projects
May 30	Natural History Studies Presentations (group practice)	Projects
May 30	Stanley J. Olsen ZOOARCHAEOLOGY CONFERENCE: Student Presentations of Projects	
June 1	Departure):	

Broader Course Goals and Learning Outcomes

This course provides students with an opportunity to acquire both technical and analytical skills linked to the analysis of faunal remains from archaeological sites. The goals of this course, therefore, are threefold: 1), to develop competence in field and laboratory vertebrate identification and analysis; 2, to develop an appreciation for the potential interpretations and inferences (archaeological and biological) which may be derived from archaeofaunal data; and 3) to gain experience in designing and conducting evolutionary ecology-based scientific research with zooarchaeological data. These goals are directly linked to several broader learning outcomes in anthropology including *the application of anthropological research methods to answer or solve a problem, and the explanation of aspects of human variation using evolutionary theory.*

Research Proposal: Guidelines

The research proposal (due **May 25**) describes in detail the research that will be conducted for the independent Research Report (see Research Report guidelines in syllabus). Students must consult with us on the nature of the research to be conducted. The proposals should be about 2-3 pages and should include a well-defined research question, a detailed description of the appropriate evidence to answer the research question, and a feasible plan for gathering and analyzing this evidence.

The proposal should begin with a few paragraphs developing the research question or problem. This should include a discussion of other previously conducted research that is relevant to your study. Situating your proposed work in the context of what already is known is key to a successful project! Be sure to include the question you are trying to answer with the research and why it is important. Next, provide details on the materials and methods. Describe the site or sites and the nature of the kinds of data you will gather (e.g., taxonomic identifications, damage patterns, skeletal part representation, age structure, etc.) and how they articulate with the research question. Be sure to include what specific indices or measures will be used. Include a references cited section using the format described in the Research Report Guidelines.

Research Report: Guidelines

The problem-oriented research report will be the culmination of your analysis of an archaeological or paleontological vertebrate assemblage (**first draft due June 12; final draft June 22**). Each student will consult with the instructors in detail on the nature of the research project to be undertaken. You will write the paper in scientific format, using the style of the *Journal of Taphonomy*. Further details and examples are included in the *Journal of Taphonomy* "Guide to Authors" in the laboratory reference file. Note that there are many differences between scientific papers and the typical "term paper" for, say, an English class. Everything is to be double-spaced and word-processed, and the pages numbered. The paper must have the following components in this order:

1. **Title page.** This page gives the title and your name and affiliation.
2. **Abstract.** This is a self-contained paragraph that encapsulates the entire study: goals, methods, results, and conclusions. It is normally no more than one double-spaced page and is separated from the Introduction. While the abstract appears first, it is invariably best to write it last.
3. **Introduction.** This section provides a brief background to the problem and takes the reader by the hand to what will be done in the paper and why it is important. Therefore, it is not the place for an exhaustive literature review but should indicate why the study was conducted and cite pertinent work by others. Introductions typically end with a paragraph more or less as follows: "To test the hypothesis that..., I analyzed x assemblages from x location." (Note: The introduction may be followed by a separate more detailed theoretical exposition.)
4. **Materials and Methods:** In the zooarchaeological context, this section is often called something like "The Site X Vertebrate Fauna". Here, the site or sites that provided the vertebrate materials are described, including pertinent background information such as the environmental setting, recovery methods, dating issues, etc. Specific taxonomic identification issues are also included in this section. Maps indicating the location of the site or sites are standard.

5. Results: What happened? In this section the data are presented, summarized and synthesized. A table including the numbers of identified specimens per taxon is standard and usually is presented first. What are the patterns in the faunal data relevant to the research problem? Graphs or other figures illustrating key trends in the data are presented here. You may not have had a course in statistics, but if you have this is the place to use what you learned. (Note: There may actually be several subheadings within the general Results section.)

6. Discussion/Conclusion. This section begins with a concise wrap-up of the salient results and whether or not they support the hypothesis outlined in the introduction. Start with the simplest, most sound conclusions from the analysis. Do not whine about the small sample sizes or make other excuses for shortcomings in the analysis. Be positive and sell the major impact this work has for our knowledge of the topic that was studied. A good closing paragraph states that your test is strong but also identifies additional lines of evidence that would provide stronger tests of the hypothesis.

7. Acknowledgments. This includes a set of “Thanks You’s” for people who helped you in the course of your analysis.

8. References. All papers cited in the text, figures or tables must be referenced and no paper should be referenced that is not cited in the paper. Failure to adhere to this indicates careless preparation. Note the way papers in the *Journal of Taphonomy* are referenced and follow their examples precisely. References in the text should be by name and date—for example: (Bayham 1979). A References Cited section should be included directly after the main text. References should be listed alphabetically as follows:

Books, monographs and doctoral theses:

Haynes, G. (1991). *Mammoths, Mastodonts and Elephants. Biology, Behavior and the Fossil Record*. Cambridge University Press, Cambridge.

Articles:

Lupo, K. D. (1994). Butchery marks and carcass acquisition strategies: distinguishing hunting from scavenging in archaeological contexts. *Journal of Archaeological Science*, 21: 827-837.

Book chapters:

Behrensmeier, A. K. (1990). Transport-hydrodynamics: bones. In (Briggs, D. E. G. & Crowther, P.R., eds.) *Paleobiology: A Synthesis*. Oxford: Blackwell Scientific Publications, pp.232-235.

9. Figures. Tables and figures are not interspersed throughout the paper but are included at the end. The “Figure Captions” page comes after the references and are all typed on the same page. For example:

Figure Captions

Figure 1. Map of the San Francisco Bay indicating location of the Patterson Shellmound.

Figure 2. The distribution of the lagomorph index by stratum at Sudden Shelter.

Figure 3. The relationship between the artiodactyl index and the numbers of identified specimens at the Evans Mound.

10. Each figure (graphs, maps, photographs, etc) should then (following the figure captions page) be placed on its own page in the order in which it appears in the text. A computer should generate graphs. No captions are required here. (I usually indicate the figure number at the bottom of each figure so I [they] don’t get them mixed up.)

10. Tables. Each table is on its own page and has a self-explanatory caption. This means that one should be able to decipher the table without reading the text. Do not include gridlines on tables. Again, see examples of previous student papers on the course website.

Department of Anthropology and University Policies

The Americans with Disabilities Act.

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

University Safety Statement.

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Discrimination

Discrimination is partiality or bias in the treatment of a person or group that is unfair or illegal. One can be subject to unfair treatment that is not illegal under university policy or state or federal law. An example would be being treated unfairly because someone doesn't like you or because of your political affiliations. Discrimination in violation of university policy is treating someone differently based on a protected class. A protected class is a group of people protected against discrimination by university policy or by state and federal law. At the University of Utah, the protected classes are: color, race, ethnicity, national origin, age, religion, disability, veteran's status, sex, sexual orientation, gender identity, gender expression and genetic information. Complaints also may be filed to Office of Equal Opportunity and Affirmative Action for harassment, including sexual harassment, and retaliation. Call 801-581-8365 or email us at oeo@utah.edu.

Bias Incident

Bias or hate incidents consist of speech, conduct, or some other form of expression or action that is motivated wholly or in part by prejudice or bias. It may or may not rise to the level of criminal activity or illegal or prohibited discrimination, but its effect is to discriminate, demean, embarrass, assign stereotype, harass, or exclude individuals because of their membership in a classification, such as race, color, ethnicity, national origin, language, sex, gender, gender identity or expression, sexual orientation, size, disability, age, veteran status, or religion. If you have witnessed or experienced a bias incident within the University of Utah community, you may use this form to report it either anonymously or with your name. Bias or hate incidents that are not criminal may be reported to the Office of Inclusive Excellence. Hate crimes may be reported to University Safety. Report a hate crime to University Safety: 801-585-2677

Addressing Sexual Assault or Sexual Misconduct.

Sexual assault is the actual or attempted sexual contact with another person without that person's consent. Sexual assault can include any of the following done without a person's consent: intentional touching of intimate parts; intentional sexual contact; coercing, forcing or attempting to coerce or force a person to touch another person's intimate parts. Sexual misconduct is a broad term used to encompass a range of behaviors including sexual or gender-based harassment, intimate partner violence, sexual exploitation, stalking, nonconsensual sexual contact and non-consensual sexual penetration. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Veterans Statement: If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M---F 8---5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class for any reason. **

Undocumented Student Support Statement. Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit dream.utah.edu.

Physical Violence

Physical violence is any behavior, action or statement made by an individual or group directed toward another individual, or group, that is threatening or intimidating and causes any reasonable individual who is the recipient of the behavior, action or statement to fear for his or her safety and/or property. It includes interpersonal and domestic violence. Such violence may be in the form of, but not limited to: causing or attempting to cause bodily injury or intimidation to another person; intentionally destroying or damaging any property, public or private; approaching or threatening another with a weapon firearms, knives, explosives or other items capable of inflicting serious bodily harm; making any oral, written or physical gesture as a threat to harm any person or property; intimidation such as stalking or engaging in actions that frighten, coerce or induce duress regarding anyone's safety or personal property. If you believe you have witnessed a crime on campus or have been a victim of a crime on campus and would like to report it anonymously, complete the Silent Witness form by using this link <https://police.utah.edu/silent-witness-form/> Report physical violence to campus police: 801-585-2677

Wellness Statement: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness (www.wellness.utah.edu; 801-581-7776).

Concerning Behavior

In today's world anyone can experience high levels of stress. Any University of Utah campus community member or visitor who encounters a student, faculty, staff or campus visitor whose behaviors are concerning, disruptive or threatening toward themselves or others may report the incident to the University of Utah's Behavioral Intervention Team (BIT) at 801-581-7066

Student Names and Personal Pronouns: Class rosters are provided to the instructor with the student's legal name as well as "Preferred first name" (if previously entered by you in the Student Profile section of your CIS account, which managed can be managed at any time). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class or on assignments. Please advise me of any name or pronoun changes so I can help create a learning environment in which you, your name, and your pronoun are respected. If you need any assistance or support, please reach out to the LGBT Resource Center. https://lgbt.utah.edu/campus/faculty_resources.php

Diversity/Inclusivity Statement

The Department of Anthropology at the University of Utah is committed to creating and fostering an equitable, inclusive and diverse community within our department and campus as a whole. We acknowledge that inequities exist based upon race/ethnicity, gender identity, gender, sexual orientation, nationality, class, culture, religion, age and ability. And although the discipline of Anthropology has long been committed to understanding, appreciating and respecting all human cultures, we further acknowledge that historically, the field has at times contributed to and reinforced structures that have subjected communities of people to objectification, marginalization, colonialism and racism. As anthropologists, we renew our commitment to respecting and valuing all human experiences and to preserving the uniqueness of populations. Within our own community, we pledge to dedicate ourselves to the important work of creating an inclusive and welcoming environment for all.

Confidential Reporting

Students, staff or faculty who would like to speak with someone confidentially should contact the Victim Advocates (801) 581-7776. Students may contact the Counseling Center (801) 581-6826, or the Women's Resource Center (801-581-8030). Information provided on this form is private and will be shared only with people who need to know.

Incomplete Policy: An "I" will only be given for work not completed because of circumstances beyond the student's control, providing the student is passing the course and needs to complete 20% or less of the work. Valid reasons for an "I" grade include: (a) An illness (documented by a medical statement) that precludes the ability of the student to perform; (b) an accident or situation that prevents the student from physically being present (documentation may be required); (c) Extreme emotional or other mental circumstances that are severe enough to interfere with a student's normal academic performance. If you do receive an "I", do not register for the course again. You must complete the required work in the time agreed by you and the instructor. If the work is not completed within one year, the grade will change to an "E". Faculty will not accept additional work to change the grade after that one-year period. If a student has a problem with the course, please deal with it immediately. It is the student's responsibility to contact instructors and submit necessary forms.

Land Acknowledgement

We acknowledge that this land, which is named for the Ute Tribe, is the traditional and ancestral homeland of the Shoshone, Paiute, Goshute, and Ute Tribes. The University of Utah recognizes and respects the enduring relationship that exists between many Indigenous peoples and their traditional homelands. We respect the sovereign relationship between tribes, states, and the federal government, and we affirm the University of Utah's commitment to a partnership with Native Nations and Urban Indian communities through research, education, and community outreach activities

Note: The syllabus is not a binding legal contract. It may be modified by the instructor when the student is given reasonable notice of the modification.