

**ANTHROPOLOGY 3839/6839: LAB RESEARCH METHODS IN ARCHAEOLOGY  
FAUNAL ANALYSIS  
Fall 2016**

**Monday: 3:00-5:15 PM  
National Museum of Natural History  
Carolyn Rose Seminar Room (Room 337)**

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**Course Instructor:** Dr. Briana Pobiner  
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**Office Hours:** by appointment  
**Office Location:** NMNH, Room 354

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**Office Hours:** Mon. 1:30-2:30PM or  
at GWU by appointment  
**Office Location:** NMNH, Room 354

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**Bulletin Course Description:** Research methods and techniques used by archaeologists. Emphasis on mammal bone identification, zooarchaeological analytical techniques, and interpretation of past human behaviors.

**Course Prerequisites**

ANTH 1003 (formerly ANTH 003): Archaeology

**Learning Outcomes:**

As a result of completing this course, students will be able to:

1. Develop the laboratory skills to identify and analyze vertebrate fossil remains from archaeological bone assemblages
2. Interpret archaeological bone assemblages in terms of human behaviors and past environments
3. Critically evaluate zooarchaeological and paleoecological studies
4. Understand the relevance of animal remains from archaeological sites to human subsistence activities, human impacts on animal populations, human evolutionary history, and environmental change.

**Average minimum amount of independent, out-of-class learning expected per week:**

On average, students are expected to spend a minimum of 8 hours per week of independent, out-of-class learning per week. This includes doing reading assignments, preparing for class discussions and presentations, preparing for lecture and lab quizzes, completing relevant statistical and laboratory exercises, and completing the final paper.

**Course Mechanics:** The course is divided into two parts, both occurring each week: a seminar (approximately 3:00-4:00PM) and a laboratory (approximately 4:00-5:15PM). The seminar section is designed to introduce you to the analysis of vertebrate fossil remains from archaeological contexts. The potential subject matter is vast; rather than attempting to cover many topics briefly, we will instead focus on a smaller number of topics in depth. By the end of the semester, you will be familiar with the major types of questions that are addressed through the study of archaeological vertebrate faunas. Of equal importance, this course will help you develop the ability to critically evaluate a wide variety of zooarchaeological and paleoecological analyses. The laboratory section is designed to provide you with detailed knowledge of the mammalian skeleton. Through the close study of comparative material, you

will learn to identify the skeletal elements and anatomical landmarks of fragmentary vertebrate remains, as is often necessary in archaeological bone assemblages.

### Seminar Requirements

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All members of the class are expected to have read, and be prepared to discuss, all articles assigned for each week. Class participation plays a major role in my assessment of your performance. At the beginning of each class (starting in Week 2) there will be a short quiz based on the previous week's lecture and readings. The lowest two scores from the full set of lecture quizzes will be dropped from your total. All readings will be provided to you electronically (on Blackboard or another similar mechanism).

Over the course of the semester, each student will be required to present a brief (~8-10 minute), detailed analysis of the class readings in presentation format, using the analytical tools learned during the semester. A proper review may require research beyond the careful reading of the assigned material itself. Two discussants will also be assigned to each of these presentations; depending on class enrollment, each person will likely serve as a discussant twice. The discussants' task is to come prepared with two or three critical questions about the article, to be directed to both the presenter and the class at large. The papers to be presented are indicated with an asterisk\* and the presentation dates are listed at the end of the syllabus. Participants will choose which paper they wish to analyze during the second week of class, and discussants will be selected after this has been done. A schedule of presentations and discussants will be distributed as soon as the paper choices have been made.

Each student will be required to write a final paper (10-15 pages) on a research question in zooarchaeology. This paper will mainly consist of a literature review and synthesis, and in the final section of the paper you will propose one or more experiments or analyses that have not yet been undertaken to investigate this research question. More details on possible paper topics will be provided later in the course. Each student must prepare a possible paper topic and list and paragraph-length summary of three key references for class on November 21<sup>st</sup>, during which individual meetings regarding the paper with each student will be held. The final paper will be due on the last day of class – **it must be turned in at the beginning of, or before, the last day of class.** There will be no final exam.

### Laboratory Requirements

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The laboratory section will provide you with detailed knowledge of the mammalian skeleton. You will learn to identify the skeletal element, side, and anatomical landmarks of even small fragments of the mammalian skeleton. The objective of the laboratory is to provide you with the skills needed to identify faunal remains from archaeological assemblages.

There will be weekly bone quizzes in the laboratory section (starting Week 3). In these short (10-15 minute) quizzes, you will be asked to identify some or all of the following: the body part (skeletal element), side, and anatomical landmarks of a wide variety of fragmentary skeletal material. The week before each quiz will be a short lecture in the laboratory session on the topic of the next week's quiz, with accompanying handouts. Each quiz may include any skeletal element discussed in class prior to that quiz. The lowest score from the full set of bone quizzes will be dropped from your total. *Note that doing well on the bone quizzes will require lab study time outside of classroom hours.*

### Evaluation and Course Logistics

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**Evaluation:** Grades are based on: (1) quality of class participation, including your performance as a discussant (10%); (2) lecture quiz performance (10%); (3) class presentation (10%); (4) statistical and laboratory exercises (10%); (5) lab quiz performance (30%); (6) final paper (30%).

**Make-Up Quizzes:** The dates for the lecture and bone quizzes are posted on the schedule below. Make travel plans accordingly. Make-up lecture and bone quizzes may be scheduled in two circumstances, as

follows: (1) if you must miss an quiz due to an unavoidable conflict, such as observance of a religious holiday or participation in a school-sanctioned sport, you must notify your instructor *prior* to the exam date; (2) if you miss a quiz for an unforeseen medical reason or emergency, *notify the course director as soon as possible*. Documentation of your reason for missing the quiz (e.g., a note from student health services) may be required. *All make-up quizzes must be taken within one week of the original quiz date.*

**Course Attendance:** The mechanics and pace of the course will require attending all classes, and class participation is part of your final grade. If you must miss class due to an unforeseen excused absence, such as illness (including flu-like symptoms) or emergency, *notify both the course director and your teaching assistant as soon as possible, within 3 days of the missed class*. Documentation of your reason for missing the class (e.g., a note from student health) may be required. Unexcused absences will result in a zero for your participation that week.

**Blackboard:** Once you are registered for this course, you will automatically have access to the Blackboard site associated with it. Go to <https://blackboard.gwu.edu/> and sign in using your email ID and password. We will use Blackboard to communicate announcements, store important documents and external links to web sites of interest that deal with material covered in the course, and provide a way for you to check your grades as the course progresses.

#### University Policies

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**University Policy on Religious Holidays:** Students should notify faculty *during the first week of the semester* of their intention to be absent from class on their day(s) of religious observance. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities.

#### **Support for Students Outside the Classroom:**

**Disability Support Services (DSS):** Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: [gwired.gwu.edu/dss/](http://gwired.gwu.edu/dss/).

**Mental Health Services (202-994-5300):** The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. [counselingcenter.gwu.edu/](http://counselingcenter.gwu.edu/)

**Academic Integrity Code:** All graded work must be completed in accordance with The George Washington University Code of Academic Integrity. Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For the remainder of the code, see: [studentconduct.gwu.edu/code-academic-integrity](http://studentconduct.gwu.edu/code-academic-integrity).

#### Security

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In the case of emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After the evacuation, seek shelter at a predetermined rendezvous location. More details will be provided on or after the first day of class.

## COURSE SCHEDULE, READINGS, QUIZZES, & EXERCISES

### **Week 1 (August 29): Introduction to Zooarchaeology**

- Bone Lecture 1: Skeletal elements, terminology, orientation, bone features
- Exercise 1: Bone identification, orientation, and surface features

Steele, T.E. 2015. The contributions of animal bones from archaeological sites: the past and future of zooarchaeology. *Journal of Archaeological Science* 56:168-176.

### **Week 2 (September 12): Quantification & Identification**

- Lecture Quiz 1: Zooarchaeology (based on Steele article)
- Bone Lecture 2: teeth
- Terminology review and discussion
- Safety and security at NMNH, proper handling of faunal collections, onsite reference books
- Assignment of papers for student presentations and discussions

Lyman, R.L. 2008. *Quantitative Paleozoology*, Ch. 2, pp. 20-56. Cambridge University Press, Cambridge.

\*Cannon, M.D. 2013. NISP, bone fragmentation, and the measurement of taxonomic abundance. *Journal of Archaeological Method and Theory* 20:397-419. [TA to present, professor and all students to discuss]

### **Week 3 (September 19): Sampling & Sample Size**

- Lecture Quiz 2: Quantification & Identification
- Bone Lecture 3: Cranium & Mandible
- Bone Quiz 1: Teeth
- Exercise 2: Quantification

Lyman, R. L. 2008. *Quantitative Paleozoology*, Ch. 5, pp. 172-213. Cambridge University Press, Cambridge.

\*Nagaoka, L. 2005. Differential recovery of Pacific Island fish remains. *Journal of Archaeological Science* 32:941-955.

### **Week 4 (September 26): Bone Transport & Differential Survivorship**

- Lecture Quiz 3: Sampling & Sample Size
- Bone Lecture 4: Scapula
- Bone Quiz 2: Cranium & Mandible
- Exercise 3: Evenness

Lyman, R.L. 1994. *Vertebrate Taphonomy*, Ch. 7, pp. 223-293.

Marean, C.W., Frey, C.J. 1997. Animal bones from caves to cities: reverse utility curves as methodological artifacts. *American Antiquity* 62:698-716.

\*Grayson, D.K., Frey, C.J. 2004. Measuring skeletal part representation in archaeological faunas. *Journal of Taphonomy* 2:27-42.

### **Week 5 (October 3): Bone Surface Modification**

- Lecture Quiz 4: Bone Transport & Differential Survivorship
- Bone Lecture 5: Innominate
- Bone Quiz 3: Scapula

Binford, L. R. 1981. Cut marks: Their form and placement on specific bones. In, *Bones: Ancient Men and Modern Myths*, pp. 105-142. Academic Press, New York.

Blumenschine, R.J., Marean, C.W., Capaldo, S.D. 1996. Blind tests of inter-analyst correspondence and accuracy in the identification of cut marks, percussion marks, and carnivore tooth marks on bone surfaces. *Journal of Archaeological Science* 23:493-507.

\*Thompson, J.C., McPherron, S.P., Bobe, R., Reed, D., Barr, W.A., Wynn, J.G., Marean, C.W., Geraads, D., Alemseged, Z. Taphonomy of fossils from the hominin-bearing deposits at Dikika, Ethiopia. *Journal of Human Evolution* 86:112-135.

### **Week 6 (October 10): Identifying the Accumulator**

- Lecture Quiz 5: Bone Surface Modification
- Bone Lecture 6: Vertebrate & Ribs
- Bone Quiz 4: Innominate
- Exercise 4: Identifying the Accumulator

Pobiner, B.L., Rogers, M.J., Monahan, C.M., Harris, J. W.K. 2008. New evidence for hominin carcass processing strategies at 1.5 Ma, Koobi Fora, Kenya. *Journal of Human Evolution* 55: 103-130.

\*Thompson, J.C. 2010. Taphonomic analysis of the Middle Stone Age faunal assemblage from Pinnacle Point Cave 13B, Western Cape, South Africa. *Journal of Human Evolution* 59:321-339.

### **Week 7 (October 17): Mortality Profiles**

- Lecture Quiz 6: Identifying the Accumulator
- Bone Lecture 7: Humerus, Radius, Ulna
- Bone Quiz 5: Vertebrae & Ribs
- Exercise 5: Mortality Profiles

Steele, T.E. 2005. Comparing methods for analyzing mortality profiles in zooarchaeological and paleontological samples. *International Journal of Osteoarchaeology* 15:404-420

\*Steele, T.E. 2004. Variation in mortality profiles of red deer (*Cervus elaphus*) in Middle Palaeolithic assemblages from Western Europe. *International Journal of Osteoarchaeology* 14:307-320.

### **Week 8 (October 31): Explaining Subsistence Change – Foraging Models**

- Lecture Quiz 7: Mortality Profiles
- Bone Lecture 8: Femur, Tibia & Fibula
- Bone Quiz 6: Humerus, Radius, Ulna

Lupo, K. D. 2007. Evolutionary foraging models in zooarchaeological analyses: Recent applications and future challenges. *Journal of Archaeological Research* 15:143-189.

\*Bird, D.W., Bleige-Bird, R., Coddington, B.F. 2009. In pursuit of mobile prey: Martu hunting strategies and archaeofaunal interpretation. *American Antiquity* 74:3-29.

### **Week 9 (November 7): Explaining Subsistence Change – Foraging Models Continued**

- Lecture Quiz 8: Explaining Subsistence Change I
- Bone Lecture 9: Metapodials
- Bone Quiz 7: Femur, Tibia & Fibula

Nagaoka, L. 2005. Declining foraging efficiency and moa carcass exploitation in southern New Zealand. *Journal of Archaeological Science* 32: 1328-1338.

\*Jones, E.L. 2006. Prey choice, mass collecting, and the wild European rabbit (*Oryctolagus cuniculus*). *Journal of Anthropological Archaeology* 25: 275-289.

### **Week 10 (November 14): Biogeography & Conservation Biology**

- Lecture Quiz 9: Explaining Subsistence Change II
- Bone Lecture 10: Carpals & Tarsals
- Bone Quiz 8: Metapodials

\*Grayson, D.K., Delpech, F. 2003. Ungulates and the Middle-to-Upper Paleolithic Transition at Grotte XVI (Dordogne, France). *Journal of Archaeological Science* 30:1633-1648.

Faith, J.T. 2007. Changes in reindeer body part representation at Grotte XVI, Dordogne, France. *Journal of Archaeological Science* 34:2003-2011

### **Week 11 (November 21): Biogeography & Conservation Biology Continued**

- Lecture Quiz 10: Biogeography & Conservation Biology I
- Bone Quiz 9: Carpals & Tarsals
- Individual student meetings: potential paper topic + 3 references due

Frazier, J. 2007. Sustainable use of wildlife: The view from archaeozoology. *Journal of Nature Conservation* 15:163-173.

\*Grayson, D.K., Delpech, F. 2005. Pleistocene reindeer and global warming. *Conservation Biology* 19:557-562.

Bovy, K. B. 2007. Global human impacts or climate change? Explaining the Sooty Shearwater decline at the Minard site, Washington State, USA. *Journal of Archaeological Science* 34:1087-1097.

### **Week 12 (November 28): Domestication & Animal Management**

- Lecture Quiz 11: Biogeography & Conservation Biology II
- Bone Quiz 10: Multiple Skeletal Elements

Diamond, J. 2002. Evolution, consequences and future of plant and animal domestication. *Nature* 418: 700-707.

Zeder, M.A. 2006. Central questions in the domestication of plants and animals. *Evolutionary Anthropology* 15:105-117.

\*Eda, M., Lu, P., Kikuchi, H., Li, Z., Li, F., Yuan, J. 2016. Reevaluation of early Holocene chicken domestication in northern China. *Journal of Archaeological Science* 67:25-31.

**Week 13 (December 5): Seasonality & Past Environments**

- Lecture Quiz 12: Domestication & Animal Management
- Bone Quiz 11: Multiple Skeletal Elements & Bone Modification

Davis, S.J.M. 1987. *The Archaeology of Animal Bones* pp. 61-90. B.T. Batsford Ltd, London.

\*Faith, J.T. 2011. Late Quaternary dietary shifts of the Cape grysbok (*Raphicercus melanotis*) in southern Africa. *Quaternary Research* 75: 159-165.

**Week 14 (December 12): Past Environments Continued - Ecomorphology**

- Lecture Quiz 13: Seasonality & Past Environments
- Final Paper due ***in or before class***

Spencer, L.M. 1995. Morphological correlates of dietary resource partitioning in the African Bovidae. *Journal of Mammalogy* 76: 448-471.

\*Plummer, T.W., and Bishop, L.C. 1994. Hominid paleoecology at Olduvai Gorge, Tanzania as indicated by antelope remains. *Journal of Human Evolution* 27:47-75.