

# Laboratory Methods in Archaeology

ANTH 329/529

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## Professor Mark Hill

Classroom: Burkhardt 309

Time: Wednesday, 2:30 to 5:50 pm

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Office Hours: Tuesday and Thursday 2:00 to 4:00 pm, Wednesdays 10:00 to 11:00, or by appointment

## Course Description

Archaeology is a science that attempts to understand human behavior, yet typically we have no living people of whom to ask questions or to observe. How, then, do we attempt to understand these past lives and societies? Archaeology uses the materials they have left behind – their tools, the remains of their meals, their broken pottery, the remains of plants that grew on and around their settlements, the soils they lived and grew crops on, and other elements of their *material culture*.

Analysis of material culture is fundamental to archaeology. In this course we will learn the techniques and concepts of archaeological laboratory methods. Through readings, presentations, and laboratory exercises, we will learn how archaeological materials such as stone tools, ceramics, animal and plant remains, metal artifacts, and others are used to provide the data we use to explore past human behavior and societies. In the process, you will learn some basic skills and knowledge in the analysis of archaeological materials.

But the course is more than an introduction to laboratory *techniques*. Through readings, presentations, and (for graduate students) a research project, you will also learn how to formulate research questions, design methods, and apply these laboratory techniques to anthropological issues. Classic and contemporary archaeological research will be used to understand the issues behind the methods, and the various kinds of research questions being addressed through the methods and materials introduced in the class. These examples will help you gain skills in the formulation of research designs, identifying appropriate methods, and applying archaeological research to the study of past human behavior.

## Course Objectives

At the end of the semester, you will have developed basic skills in the identification, processing, and analysis of archaeological materials such as lithics, ceramics, plant and animal remains, and historic artifacts.

More importantly, you will also have developed a critical approach to the formulation of archaeological research issues, the development of research designs, and the application of your newly developed techniques to important anthropological issues.

You will also gain practice and experience in presenting archaeological research to audiences through oral presentations, and will have opportunities to improve your writing skills through laboratory assignments and (for graduate students) a research paper.

## Readings and Texts

While this course will involve laboratory assignments, it is also a rather reading-intensive course. We will read much of our assigned text, and use that to guide our laboratory assignments. However, you will also read several classic and contemporary research publications as listed in this syllabus and in supplemental handouts. You will be expected to come to class having read those materials, and will need to participate in class discussions of the issues and questions raised by those readings.

The required text is:

Mark Q. Sutton and Brooke S. Arkush,  
2009 *Archaeological Laboratory Methods*, Fifth Edition. Kendall/Hunt, Dubuque, Iowa.

## Blackboard

Announcements, syllabus, assignments, and other materials will be available on the class Blackboard website. Discussion questions must be submitted on the website by noon Tuesday each week.

## Course Requirements

The course content will be presented in lectures, readings, presentations, lab assignments, and discussions. There will be no exams, instead students will be graded on lab assignments, in-class presentations, and participation. Graduate students will also be graded on a final research project due at the end of the semester.

The course assumes some familiarity with anthropology and archaeology. Lectures will introduce key concepts and will complement the assigned readings. Readings must be completed before class and will be discussed in class. Attendance is expected. If you are unable to attend a class you must make arrangements with the instructor.

## Class Time and Organization

The class meets for three hours and twenty minutes on Wednesday afternoons (and yes, we will have a break). This time will be divided into lecture, student presentations and discussion, and laboratory assignments. In general, class will begin with a lecture and introduction of that week's subject. Following the lecture, there will be student presentations and a formal discussion based on the readings assigned for that week. Each student will present two reading summaries during the semester, and all students will participate in discussions. Each week's readings must be completed prior to class.

Reading summaries will be assigned during the first week of class, and presentations and discussion will begin in the second week of the semester. Each reading summary will consist of a 1 page typed handout provided to all class members, and a fifteen minute presentation. The presentation will include a discussion of the background of each author, a summary of key points in the article, a discussion of how it applies to the analysis of archaeological materials, and a critique. After the fifteen minute presentation, the student

will then lead a discussion of the article and all students will participate. Each reading summary is worth 25 points for a maximum available total of 50 points.

Those students who are not presenting an article summary will submit two discussion questions no later than noon on the Tuesday prior to class. Questions should focus on theoretical or methodological issues of the articles, issues related to the author's interpretations of the results, or points of clarification. These questions are worth 5 points per discussion session, or a maximum available total of 70 points

Following the student presentations and class discussion, the week's lab assignment will be introduced. There will be fourteen lab assignments (each worth 20 points for a maximum total of 280 points), and time will be provided in class to begin that assignment, but additional time outside of class will likely be required. Lab assignments will take place in the Applied Archaeology Laboratory facilities in 314 Burkhardt Building. The lab will remain open during normal business hours and students can work on the assignment at anytime during the day. Lab assignments will be due at the start of class on the following Tuesday.

## **Graduate Student Research Papers and Undergraduate Extra Credit**

Graduate students will also be expected to complete a final research project. By Wednesday, September 14, graduate students must submit a research proposal (worth 15 points) to the instructor that outlines the question to be addressed, proposes methods, presents a brief relevant literature review, and identifies collections that will be used in the study. The instructor will review each proposal and provide recommendations for consideration in the final study. After the instructor's approval, graduate students will present a brief synopsis of their research proposal to the class on September 28<sup>th</sup>, and afterwards may begin working on their final research project. Graduate students are encouraged to recruit undergraduate class members as members of their research team. Undergraduates who assist with a graduate student research project will receive up to 20 extra credit points based upon the recommendation of their graduate student supervisor. This final research paper is worth 85 points and will be due on the scheduled final exam date. Combined with the 15 points for the proposal, this project is worth a total of 100 points, or 20% of your grade. The final week of class will be reserved for work on this project.

## **Late Assignments**

Since the course must cover a wide range of issues and topics in a short period, students are **STRONGLY** encouraged to turn in assignments on time. If you know that an assignment will be late due to circumstances beyond your control, notify the instructor as early as possible. Without such notification and approval, late assignments may not be accepted.

## **Grading**

A maximum of 500 points will be possible for graduate students, 400 points for undergraduates (14 labs at 20 points each, 2 reading summaries at 25 points each, 14 discussion questions at 5 points each, and a final project for graduate students at 100 points). Grading will not be done on the curve, but will be based upon a percentage of the total available points. Grades will be assigned as follows:

### **Graduate Students:**

A ≥465 (93%)	B+ 435-449½ (87%)	C+ 385-399½ (77%)	D+ 335-349½ (67%)
A- 450-464½ (90%)	B 415-434½ (83%)	C 365-384½ (73%)	D 300-334½ (60%)
	B- 400-414½ (80%)	C- 350-364½ (70%)	Fail <300 (<60%)

### **Undergraduate Students:**

A ≥372 (93%)	B+ 348-359½ (87%)	C+ 308-319½ (77%)	D+ 268-279½ (67%)
A- 360-371½ (90%)	B 332-347½ (83%)	C 292-307½ (73%)	D 240-267½ (60%)
	B- 320-331½ (80%)	C- 280-291½ (70%)	Fail <240 (<60%)

## **Academic Honesty**

Students are expected to uphold the Ball State University standard for conduct relating to academic integrity. Students assume full responsibility for the content and integrity of the academic work they submit. The guiding principle of academic integrity shall be that their submitted work, examinations, reports, and projects MUST BE THEIR OWN WORK. Make sure to cite all sources. Plagiarism of any sort, whether of the "word for word" variety, paraphrasing, or "mosaic" plagiarism, is unacceptable and unethical. Any student found plagiarizing will FAIL the course. IGNORANCE IS NO EXCUSE.

Guidelines for how and when to cite will be made available to students. Citations in this course will follow the Society for American Archaeology style, and more can be learned about that citation format at the SAA website ([www.saa.org](http://www.saa.org)).

All occurrences of academic misconduct will be dealt with in accordance with the Student Academic Ethics Policy guidelines and procedures outlined at <http://cms.bsu.edu/About/AdministrativeOffices/StudentRights/PoliciesandProcedures/StudentCode/VIIEthicsPolicy.aspx>

## **Access and Opportunity for Students with Disabilities**

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My office location and hours are shown on the first page of this syllabus.

## COURSE SCHEDULE

Week 1, August 24: Introduction and "Thinking from Things"

**Textbook:** Chapters 1 and 2

**Assignment:** Garbage

Week 2, August 31: Data and Classification in Archaeology

**Textbook:** Chapters 2 and 3

**Lab:** Records and Cataloging

Week 3, September 7: Lithic Raw Materials

**Textbook:** Chapter 4

**Lab:** Lithic Raw Material Identification

Week 4, September 14: Lithic Debitage

**Textbook:** None

**Lab:** Lithic Debitage Attributes

Week 5, September 21: Lithic Tools

**Textbook:** None

**Lab:** Lithic Tools and Mobility

Week 6, September 28: Groundstone

**Textbook:** Chapter 5

**Lab:** Groundstone

Week 7, October 5: Prehistoric Ceramics

**Textbook:** Chapter 6

**Lab:** Prehistoric Ceramics I

Week 8, October 12: Prehistoric Ceramics

**Textbook:** None

**Lab:** Prehistoric Ceramics II

Week 9, October 19: Faunal Analysis; Identification and Quantification

**Textbook:** Chapter 10

**Lab:** The Mammal Skeleton: Appendicular

Week 10, October 26: Faunal Analysis; Identification continued and Interpretation

**Textbook:** None

**Lab:** The Mammal Skeleton: Axial

Week 11, November 2: Textiles and Perishables

**Textbook:** Chapter 8

**Lab:** Textiles

Week 12, November 9: Macrobotanicals and Pollen

**Textbook:** Chapter 11

**Lab:** Plant recovery and identification

Week 13, November 16: Archaeochemistry and archaeometry

**Textbook:** Chapter 13

**Lab:** Archaeometry

Week 14, NO CLASS -----THANKSGIVING-----

Week 15, November 30: Historic Materials

**Textbook:** Chapter 9

**Lab:** Historic Artifacts

Week 16, December 7: Final Projects.

**No Class, students to work on final lab projects and papers.**

## Reading Assignments

### Week 1 Thinking from Things

Binford, Lewis R.

1965 Archaeological Systematics and the Study of Culture Process. *American Antiquity* 31:203-210

Wylie, Allison

2002 Introduction, In *Thinking from Things*, Chapter 1 pp. 1-22. University of California Press, Berkeley.

**Starting with Week 2, each of you needs to select TWO articles from the following list, and present it in class.**

### Week 2 Data and Classification in Archaeology

Brew, John O.

1971 The Use and Abuse of Taxonomy. In *Man's Imprint on the Past*, edited by J. Deetz, pp. 73-107. Little Brown, Boston

Ford, James A.

1954 The Type Concept Revisited. *American Anthropologist* 56:42-53

Spaulding, Albert C.

1953 Statistical Techniques for the Discovery of Artifact Types. *American Antiquity* 18:303-313

### Week 3 Lithic Raw Materials

Andrefsky, William Jr.

1998 *Lithics: Macroscopic Approaches to Analysis*, Chapter 3. Cambridge University Press, Cambridge.

Kooyman, Brian P.

2000 Sourcing Lithic Materials. In *Understanding Stone Tools and Archaeological Sites*, Chapter 4 pp. 39-44. University of Calgary Press, Calgary.

Tykot, Robert H.

2003 Determining the Source of Lithic Artifacts and Reconstructing Trade in the Ancient World. In *Written in Stone: The Multiple Dimensions of Lithic Analysis*, edited by P. Nick Kardulias and Richard W. Yerkes, pp. 59-85, Lexington Books, Lanham, Maryland.

### Week 4 Lithic Debitage

Amick, Daniel S. and Raymond P. Mauldin

1997 Effects of Raw Material on Flake Breakage Patterns. *Lithic Technology* 22:18-32

Andrefsky, William Jr.

1998 *Lithics: Macroscopic Approaches to Analysis*, Chapters 4 and 5 pp. 71-135. Cambridge University Press, Cambridge.

Andrefsky, William Jr.

2001 Emerging Directions in Debitage Analysis. In *Lithic Debitage: Context, Form, and Meaning*, edited by William Andrefsky Jr., The University of Utah Press, Salt Lake City.

Sullivan, Alan P. and Kenneth C. Rosen

1985 Debitage Analysis and Archaeological Interpretation. *American Antiquity* 50:755-779

## Week 5 Lithic Tools

Andrefsky, William Jr.

1998 Approaches to Stone Tool Analysis. In *Lithics: Macroscopic Approaches to Analysis*. Cambridge University Press, Cambridge

Bamforth, Douglas B.

1986 Technological Efficiency and Tool Curation. *American Antiquity* 51:38-50

Binford, Lewis R.

1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35:255-273

## Week 6 Groundstone

Adams, Jenny L.

1988 Use Wear Analysis on Manos and Hide Processing Stones. *Journal of Field Archaeology* 15:307-315

Hard, Robert J., Raymond P. Mauldin, and Gerry R. Raymond

1996 Mano Size, Stable Carbon Isotope Ratios, and Macrobotanical Remains as Multiple Lines of Evidence of Maize Dependence in the American Southwest. *Journal of Archaeological Method and Theory* 3:253-318

Zarillo, Sonia, and Brian Kooyman

2006 Evidence for Berry and Maize Processing on the Canadian Plains from Starch Grain Analysis. *American Antiquity* 71:473-499.

## Week 7, Prehistoric Ceramics

Lesure, Richard G.

1998 Vessel Form and Function in an Early Formative Ceramic Assemblage from Coastal Mexico. *Journal of Field Archaeology* 25:19-36

Rice, Prudence

1996a Recent Ceramic Analysis: 1, Function, Style, and Origins. *Journal of Archaeological Research* 4:133-163

## Week 8 Prehistoric Ceramics Lab – No Readings this week

## Week 9 Faunal Analysis; Identification and Quantification

Grayson, Donald K.

1984 The Basic Counting Units. In *Quantitative Zooarchaeology*, Chapter 2, pp. 26-90. Academic Press, New York.

Meltzer, David, Robert Leonard, and S. Stratton

1992 The Relationship Between Sample Size and Diversity in Archaeological Assemblages. *Journal of Archaeological Science* 19:375-387.

Schaffer, Brian

1992 Quarter Inch Screening: Understanding Biases in Recovery of Vertebrate Faunal Remains. *American Antiquity* 57:129-136.

## Week 10 Faunal Analysis; Identification cont., and Interpretation

Byers, D., and J. Broughton

2004 Hooecene Environmental Change, Artiodactyl Abundances, and Human Hunting Strategies in the Great Basin. *American Antiquity* 69:235-256

Broughton, J



- 1997 Widening Diet Breadth, Declining Foraging Efficiency, and Prehistoric Harvest Pressure: Ichthyofaunal Evidence from the Emeryville Shellmound. *California Antiquity* 71:845-862  
Jackson, H.E., and S. Scott  
2003 Patterns of Elite Faunal Utilization at Moundville, Alabama. *American Antiquity* 68:552-572

### Week 11 Textiles and Perishables

- Croes, Dale R.  
1995 Basketry. In *Hoko River Archaeological Site Complex*, pp. 107-143. Washington State University Press, Pullman.  
Baldia, Christel M., and Kathryn A. Jakes  
2007 Photographic Methods to Detect Colourants in Archaeological Textiles. *Journal of Archaeological Science* 34:519-525  
Frison, George C., R.L. Andrews, James M. Adovasio, R.C. Carlisle, and Robert Edgar.  
1986 A Late Paleoindian Animal Trapping Net from Northern Wyoming. *American Antiquity* 51:352-361

### Week 12 Macrobotanicals and Pollen

- Bryant, Vaughn M. Jr., and Richard G. Holloway  
1983 The Role of Palynology in Archaeology. *Advances in Archaeological Method and Theory* 6:191-224  
Miller, Naomi F.  
2002 The Analysis of Archaeological Plant Remains. In *Archaeology: Original Readings in Method and Practice*, edited by P.N. Peregrine, C.R. Ember, and M. Ember,

### Week 13 Archaeochemistry and Archaeometry

- Hill, Mark A.  
2009 Tracing Exchange and Interaction: Using Lithic Sourcing and Chemical Composition of Copper to Identify Communities of Interaction. In *The Benefit of the Gift: Exchange and Social Interaction in the Late Archaic Western Great Lakes*. PhD Dissertation, Department of Anthropology, Washington State University, Pullman.  
  
Lizee, Jonathan M., Hector Neff, and Michael D. Glascock  
1995 Clay Acquisition and Vessel Distribution Patterns: Neutron Activation Analysis of Late Windsor and Shantok Tradition Ceramics from Southern New England. *American Antiquity* 60:515-530

### Week 14, Thanksgiving Break –NO CLASS—

### Week 15, Historic Materials

- South, Stanley  
2002 *Method and Theory in Historical Archaeology*. Percheron Press, Clinton Corners New York.

Additional Article to be Announced

### Week 16, Final Projects –NO READINGS—

## How to Give Credit When Credit is Due

The following gives several examples of citations. Different disciplines use different styles of citations. One usually uses the citation style of their particular discipline. However, to make things simple, I would like you to use the following citation style for your assignments. This handout does not contain every citation scenario. However, it should offer you examples of most of the citations you will need to use. If it does not cover something, please ask me. If it is a quote or if you are paraphrasing, you should include the following information: (Author's last name year of publication: page number(s)).

For Example: (Smith 1992:54)

For multiple authored papers (3 or more authors) you do not need to list every name. Please put (Smith et al. 1992:54).

### IN-TEXT CITATIONS:

You are required to cite the sources of any and all information you obtain for any of your writing assignments. What that means is **if you use someone else's idea and do not give them credit, it is plagiarism**. The best piece of advice I can give you is if you are not sure whether you should cite something, you probably need to cite it.

For example, you write the following sentence ....

The development of human creatures from their earliest origins has become one of the most controversial of modern sciences.

This is actually a direct quote from a book. If you write this, you must put it in quotes and have an in-text citation following the sentence.

“The development of human creatures from their earliest origins has become one of the most controversial of modern sciences” (Adler and Pouwels 2006:4).

Now, let say you did not want to use a direct quote, but you still wanted to use that idea in your paper. Maybe you write.....

In modern science, the evolution of humans from early to later forms has become a very controversial issue.

While this sentence might seem like a silly example, I am trying to stress the necessity of citations. If it is not your idea, it needs to be cited. Since it is not a direct quote, there is no need for quotation marks, but you still need an in-text citation.

In modern science, the evolution of humans from early to later forms has become a very controversial issue (Adler and Pouwels 2006:4).

*Special note on in-text web citations:* If the website you are using has an author, put the author's name and date of the article in parentheses as shown above for books and articles. If there is not an author listed, put the URL in parentheses.

## REFERENCES CITED PAGE:

At the end of your written work, you will need to include a reference cited page. On that page, you will list *every* source that you got information from. Therefore, for every in-text citation that is in the body of your essay or paper, there will be a full citation on the references cited page. The following are examples of different types of sources that you will be getting information from. Follow these examples when writing your reference cited page. Your references cited page should be in **alphabetical order** by the primary author's name. All of the information listed under each category is necessary. So, make sure that you get all of the information from your references before you turn a journal or book back into the library.

### A Book

Hewlett, B. S.

- 1991 *Intimate Fathers: The Nature and Context of Aka Pygmy Paternal Infant Care*. Ann Arbor: The University of Michigan Press.

### A Chapter in an Edited Volume (Edited Book)

Hawkes, Kristen, J. F. O'Connell, N. G. Blurton Jones, H. Alvarez, and E. L. Charnov

- 2000 The Grandmother Hypothesis and Human Evolution. In *Adaptation and Human Behavior: An Anthropological Perspective*, edited by N. Chagnon, W. Irons, and L. Cronk, pp. 237-258. New York: Aldine de Gruyter.

### An Article in an Academic Journal (for electronic as well)

Adler, Michael A.

- 1996 Land Tenure, Archaeology, and the Ancestral Pueblo Social Landscape. *Journal of Anthropological Archaeology* 15(4): 337-371.

### A Dissertation or a Thesis

Harro, Douglas R.

- 1997 Patterns of Lithic Raw Material Procurement on the Pajarito Plateau, New Mexico. Unpublished Master's thesis, Department of Anthropology, Washington State University.

### A Web Site (for E-Journals)

Williams, G. S.

- 2001 *Why do I Have to Take a Course on World Civilization?* Retrieved August 24, 2005 from <http://www.worldcivilizations.com>

### Audiovisual Material

BBC-TV Production

- 1995 *Under the Sun: A Caterpillar Moon*. British Broadcasting Corporation Television Service. 1 videocassette (49 minutes), VHS format.