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Fall 9-1-2021

### ANTY 454.01: Lithic Technology

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#### Recommended Citation

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# **ANTY 454 LITHIC TECHNOLOGY**

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## **PANDEMIC AND RELATED INFORMATION**

- This course will be taught on an in-person face-to-face basis. However, the course could shift to Remote via Zoom if there is a crisis with the pandemic or other issue.
- If you are sick or displaying symptoms, please contact the Curry Health Center at (406) 243-4330
- Up-to-Date COVID-19 Information from the University of Montana:
- UM Coronavirus Website: <https://www.umt.edu/coronavirus>
- Remain vigilant in mitigating the spread of COVID-19

### *I. GOALS:*

The course will provide a comprehensive introduction to method and theory in lithic technology. It will begin with an introduction to lithic raw materials, fracture mechanics, and basics of stone tool knapping. It will cover analytical methods associated with core reduction, tool production, debitage studies, formation processes, use-wear analysis, groundstone studies, and theoretical perspectives on lithics. An important part of becoming a lithic analyst is learning the basics of stone tool manufacture. Students will, therefore, learn the basics of flintknapping.

### *II. PURPOSE:*

**A. MISSION STATEMENT:** This course is an elective for anthropology majors.

### **B. Objectives for the student:**

1. To identify and understand the range of lithic artifacts made and used by ancient and recent people.
2. To develop concepts that aid in our understanding of how and why people used different lithic technologies.
3. To develop concepts and methods which aid in the interpretation of the archaeological record.
4. To practice analytical skills in evaluating basic archaeological research.
5. To read primary and secondary sources and consider their significance to archaeological problems.

### **C. Goals for the student:**

1. To develop a broad perspective on the economy and social organization of past peoples as reflected by lithic artifacts.
2. To develop ability to identify important analytical strategies for researching the archaeological record of lithic technology.
3. To develop the ability to recognize archaeological signatures of past behavior.
4. To be able to use sophisticated theoretical concepts from anthropology to explain change and variation in the organization of lithic technology.

### **D. General Learning Outcomes** for the student:

In addition to basic content-related objectives outlined above, the course has several general liberal-learning goals for developing basic academic skills. With successful completion of this course the student will improve ability in the following areas:

1. To develop the ability to manage data requiring the student to organize information and distinguish between empirical fact, inference, and theory.
2. To develop the ability to understand organizing principles to be used in sorting information.
3. To compare and evaluate arguments.
4. To organize thoughts and communicate these in written form.
5. To practice in synthesizing information during constrained time periods (as in exams).

### **III. GENERAL REQUIREMENTS**

**A. Prerequisites:** None (recommend ANTY 250)

### **B. Texts and readings:**

#### Required Texts:

Andrefsky, William, Jr.  
2005 *Lithics: Macroscopic Approaches to Analysis*, Second Edition.  
Cambridge University Press, Cambridge.

Odell, George H.  
2003 *Lithic Analysis*. Springer, New York.

#### Recommended Texts:

Andrefsky, William, Jr. (editor)  
2008 *Lithic Technology: Measures of Production, Use, and Curation*.  
Cambridge University Press, Cambridge.

*Grade Determination:* The primary goal of this course is to provide an introduction stone knapping and the methods of lithic artifact analysis. To accomplish this goal the course will include both lecture and "hands-on" experience. Grades will be determined as follows: (1) Two take-home tests covering lecture and readings will be worth 100 points each; (2) A final class research project worth 150 points; and (3) A research project presentation worth 50 points. Research Project Option One: Students will manufacture a collection of chipped stone tools and provide a narrative explaining knapping procedures and insights (see handout). Research Project Option Two: Students will conduct a research project that will include analysis of lithic artifacts (can be experimentally produced) or lithics data from other sources culminating in a 10 page (20 pages for graduate students) paper. Whether option one or two, papers should be double-spaced with at least ten sources cited. If option two is taken, the project must be approved by the professor and incorporate (1) a discussion of goals, methods, and materials; (2) references to relevant literature; (3) presentation, analysis, and interpretation of the data; (4) conclusions and possible future directions. Students will also briefly present results of their project for class discussion during the final week of the semester. A PowerPoint show is required.

Graduate students must chose option two and complete a research paper twice the length of undergraduate projects. The paper should reflect a higher degree of awareness of issues in archaeological research. It should also reflect more intensive background research and consideration of research design.

Assignments and exams can be submitted to the professor as Word documents via email ([anna.prentiss@umontana.edu](mailto:anna.prentiss@umontana.edu)).

There are 400 points possible in the class; students with 90% (360 points) or more will receive an "A," etc. Deadlines are extended only in cases of illness or an emergency. The professor reserves the right to use "+" or "-" if grades are within one point of a transition.

## **TOPIC AND READINGS SCHEDULE**

### **August 30 - September 8: COURSE INTRODUCTION; LITHICS TERMINOLOGY AND BASIC FRACTURE MECHANICS; INTRODUCTION TO STONE KNAPPING**

Required:

Andrefsky, Chapters 1 and 2  
Odell, Chapters 1 and 3

### **September 10-13: LITHIC RAW MATERIALS AND SOURCING**

Required:

Andrefsky, Chapter 3  
Odell, Chapter 2

**September 15-24: LITHIC CORE REDUCTION: MANUFACTURE AND ANALYSIS OF BIPOLAR CORES; PIECES ESQUILLEES; PREPARED CORES; LEVALLOIS CORES; BLADE CORES; INTRODUCTION TO TYPOLOGY**

Required:

Andrefsky, Chapter 7, pp. 143-177  
Odell, Chapter 3

**September 27-29: FLAKE TOOL TECHNOLOGY**

Required:

Andrefsky, Chapter 7, pages 160-177  
Odell, Chapter 3, pages 62-74

Recommended:

Andrefsky (2008), Chapters 1-3, 5-7

**October 1 – October 18: MANUFACTURE AND ANALYSIS OF FORMED TOOLS: BIFACES, PROJECTILE POINTS, DRILLS, AND SCRAPERS**

Required:

Andrefsky Chapter 7, pp. 177-195  
Odell, Chapter 3 and Chapter 4 (pp. 87-118)

Recommended:

Andrefsky (2008), Chapters 4, 7, 8, and 9

**October 20: TEST 1 (TAKE HOME EXAM DUE – NO CLASS MEETING)**

**October 22–29: DEBITAGE ANALYSIS**

Required:

Andrefsky, Chapters 5 and 6  
Odell, Chapter 4 (pp. 118-133)

**November 1-5: FUNCTIONAL ANALYSIS: USE-WEAR, RESIDUES, EDGE ANGLES, EMPLOYABLE UNITS ANALYSIS**

Required:

Andrefsky Chapter 7, pp. 195-200  
Odell, Chapter 5

**November 8-12: GROUNDSTONE**

Required:

Odell, Chapter 3 (pp. 74-85)

**November 15–December 1: THEORETICAL LITHICS: RECONSTRUCTING PAST BEHAVIOR, ORGANIZATION, AND EVOLUTION**

Required:

Andrefsky, Chapters 8 and 9  
Odell, Chapter 6

Recommended:

Andrefsky (2008), Chapters 9, 10, 12, 13, and 14

**November 24-26: HOLIDAYS**

**December 3-10: PROJECT PRESENTATIONS** (*Research Projects due December 10*)

**December 16: TEST 2 TAKE HOME EXAM DUE – NO CLASS MEETING**

## **ANTY 454 Lithic Technology**

### **Schedule for Knapping Sessions**

Sept. 8: Introduction to knapping; bipolar cores (outside on grass east side of Social Science Bldg: weather dependent).

17: Freehand core reduction/using hard hammers (outside on grass east side of Social Science Bldg: weather dependent).

22: Freehand core reduction/using hard hammers (outside on grass east side of Social Science Bldg: weather dependent).

29: Flake Tool manufacture using hard and soft hammers (outside on grass east side of Social Science Bldg: weather dependent).

Oct. 4: Biface reduction/using soft hammers (outside on grass east side of Social Science Bldg: weather dependent).

8: Biface reduction/using soft hammers (outside on grass east side of Social Science Bldg: weather dependent).

13: Biface and projectile point production/using pressure flakers (outside on grass east side of Social Science Bldg: weather dependent).

18: Biface and projectile point production/using pressure flakers (outside on grass east side of Social Science Bldg: weather dependent).

## ANTY 454 OPTION ONE TERM PROJECT

Students will produce one example of each of the following lithic tool types:

Unidirectional core (can be a blade core)  
Levallois core  
Single scraper (sometimes called a side scraper)  
End scraper  
Unifacial knife  
Bifacial knife  
Burin  
Bifacial or unifacial drill  
Stage 3 (Callahan 1979) biface  
Stage 4 (Callahan 1979) biface  
Notched (side or corner) bifacial projectile point

Students will also provide a narrative briefly (maximum 300 words for each tool) explaining manufacture procedure for each item. The narrative will conclude with a short discussion of implications. What did you learn about lithic tool manufacture from this exercise? Does this provide a frame of reference for interpreting variation in ancient lithic artifacts? How?

Written portion shall be typed with 12 point font with at least six cited sources.

Students will provide photographs and/or drawings of their tools (plan and lateral views) to be incorporated into their written paper and PowerPoint presentation.

Reference cited:

Callahan, E. 1979. The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flint Knappers and Lithic Analysts. *Archaeology of Eastern North America* 7 (1): 1-180.