LITHICS ANALYSIS IN ARCHAEOLOGY

CRN: 88403—4.0 credits
Time: TH 12:00–2:30 pm + TBA open lab
Classroom: Dean Hall 202
Instructor: Prof. Christian E. Peterson
E-mail: cepeter@hawaii.edu
Office: Dean Hall 201
Office Phone: (808) 956-8460
Office Hours: T/W/Th 10:30–11:30

Course Description

This course is a basic introduction to the manufacture and analysis of flaked and ground stone tools. The approach is tripartite: typological, functional, and technological. We will discuss raw material properties and selection; production/reduction techniques; formal tool description, classification, and analysis; waste product (debitage) identification and its aggregate analysis; functional (use-wear and residue) studies; and quantitative approaches to the study of stone tools. We will also examine the ways in which lithics analysis can enlighten us about past human behavior in both small-scale and more complex societies. Students will work with both archaeological and experimental collections, and engage in stone tool manufacture themselves.

Course Prerequisite

ANTH 210 and ANTH 380 or equivalent (upon consent of the instructor). Students who have previously taken other upper division courses in archaeology (including analytical and/or quantitative components) will find these to be of benefit.

Enrollment

Enrollment is limited to 10 students (12 at instructor discretion).

Course Requirements

This is an upper division undergraduate/graduate lab course. You are expected to come to class prepared to contribute (frequently) to class discussions, and to work with your fellow students in the completion of laboratory assignments. Your participation in in-class discussions and lab work will be graded. There will be eight take-home lab assignments to complete, as well as a final exam. Most assignments will require you to work in the lab outside of regular class hours; times when the lab will be open for use will be determined within the first two weeks of the semester and posted online. Please be advised that your instructor’s lecture notes will NOT be made available to students, either as hardcopy or in electronic form (you are expected to take your own). Regular class attendance is HIGHLY recommended.
Required Readings

Specific readings assignments are given for each week (see Course Calendar below). You are expected to do these readings before the relevant class, and you should be able to answer questions pertaining to the reading material. There is one required textbook for this course. It is available for purchase at the University Bookstore, or online (from Amazon.com, etc.), if you prefer.

Odell, George H.

Additional weekly required readings (articles) by topical unit will be provided prior to the beginning of each unit (see the Course Calendar and list of Additional Required Readings below). These readings will be available in PDF format for download and printing from Laulima on a unit-by-unit basis. A NOTE ABOUT ADDITIONAL READINGS: many of the materials you will be asked to read were not written with the general public, or even an undergraduate audience in mind; many assume the reader is a professional archaeologist. These readings are challenging and they will require considerably more time and effort (on both your part and mine) to digest and make sense of than conventional textbooks. Your hard work will be rewarded with an increased appreciation for stone tools and how we can use them to better our understanding of past human behavior.

Undergraduate Grading Policy

There are a total of 100 points available to be earned in this course (each equivalent to one percent of your final grade). Students earning a cumulative total equal to or more than 60 points (a D-) pass the course and will be assigned a letter grade according to the table below. Students earning less than 60 points fail the course and receive a letter grade of "F".

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<th>ADEQUATE PERFORMANCE</th>
<th>INADEQUATE</th>
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<tr>
<td>Excellent</td>
<td>A+ 97–100</td>
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<td>Above Average</td>
<td>B+ 87–89</td>
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<tr>
<td>Average</td>
<td>C+ 77–79</td>
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<tr>
<td>Below Average</td>
<td>D+ 67–69</td>
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<td>Failing Grade</td>
<td>D 63–66</td>
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GRADE BREAKDOWN:
5 points—lab assignment 1 (raw material inventory)
5 points—lab assignment 2 (flake morphology and lithic illustration)
5 points—lab assignment 3 (measurement and quantification)
10 points—lab assignment 4 (lithic refitting)
10 points—lab assignment 5 (classification, typology, and tool use)
15 points—lab assignment 6 (typological and attribute analysis of debitage)
10 points—lab assignment 7 (mass analysis of debitage)
10 points—lab assignment 8 (experimental archaeology)
10—student-led discussions (singly, or in groups of 2–3)
20—final exam

LECTURES AND LABS: You are required to attend all lectures/discussions, labs, and student presentations. There is no grade for attendance and in-class participation, although you are expected to come to every class prepared to participate fully. This preparation begins with having read, and taken brief notes on, all assigned reading prior to each class meeting. These readings, and your notes, are the launching pad for all in-class discussion, lab assignments, and/or demonstrations. Be aware that you may be called upon to directly and succinctly answer questions pertaining to material raised in the texts, or regarding the content, relationships between articles, or contrasting views represented. On flintknapping practicum days we will continue to meet in Dean 202.
LAB ASSIGNMENTS: Each student will conduct a lithic analysis in lab throughout the term on various components of an aggregate lithic assemblage. We will take these various components to be representative portions of a living floor, provenienced as if it were an actual archaeological site. Each laboratory assignment (with a couple of exceptions) will ask you to analyze your portion (or sample) of the living floor assemblage with a particular question in mind and to submit a report. Some reports will be due by the next class meeting, others in one week’s time (or more). These assignments will require answers in the form of short essays, as well as the use of summary statistics and statistical tests (using MySTAT 12, a free downloadable student statistical package from SYSTAT), tables, and graphs. (We will discuss how to undertake and understand the more quantitative aspects of these analyses in class.) In many cases we should be able to collect the necessary information to complete lab assignments in class; in others, however, you may need to spend additional hours in the lab outside of regular class time. Your instructor will arrange for the lab to be open at specific times outside of regular class hours at particular points throughout the term (to be determined later). The quality and presentation of your written reports are important components of each assignment, as they must be clearly and concisely written in order to be understandable and potentially useful to others. By the end of the course, these lab assignments will form the core of a final lab report, comparable to any basic professional report on a newly investigated archaeological site. The skills learned in creating these reports will allow you to conduct independent analysis for senior-level undergraduate research projects, or serve as a foundation for graduate student thesis research, postgraduate field work, or Cultural Resource Management (CRM) purposes.

Each lab assignment is worth between 5% and 15% of your final grade (5–15 points). Please note that take-home lab assignments will be penalized 10% per day if submitted late, up to a maximum of 5 days (or 50%), which includes weekends, after which time they will no longer be accepted and you will be given a zero for the assignment. This penalty will only be waived in exceptional (documented) cases of dire illness, emergency, or an outstanding civic obligation (such as jury duty).

STUDENT-LED DISCUSSIONS: Each student is responsible for leading discussion of the assigned readings during one class period in the last third of the semester. (A sign up sheet will be circulated ahead of time.) If there are enough students enrolled in the course then students will work in pairs or groups of three. These student-led discussions are worth 10 points (or 10% of your final grade). Students should not attempt to summarize the articles assigned; rather, they are to initiate and facilitate continued discussion of the issues raised therein. It is usually most enlightening to develop lines of questioning that throw observed differences between authors into sharp relief. Students may wish to consult the instructor as they develop their questions.

FINAL EXAM: There is one formal examination in this course. This final exam is worth 20 points (or 20% of your overall grade). It will be administered in class and will draw from assigned readings, lectures, and video presentations. Exam questions may include definitions, matching, multiple choice, short-answer, and/or brief essays. Make-up exams will be permitted only in cases of documented medical (or other) emergency.

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Graduate Grading Policy

Graduate students taking this course will be held to a higher academic standard than their undergraduate colleagues. In addition to completing all undergraduate lab assignments, graduate students will be required to give an in-class presentation and lead subsequent discussion. Graduate students will meet with the instructor during the first week of class to discuss their additional responsibilities.

Safety

The handling and analysis of finished lithic artifacts and debris, and especially the practice of flintknapping itself, are inherently dangerous activities. Stone tools, debitage, and even raw material may be sharp! The odds are very good that you will be cut (or otherwise injured) at least once during this course. To guard against this as much as possible, proper attention to safety is required.
On REGULAR CLASS DAYS please observe the following procedures:

1. Handle lithic artifacts, debitage, and raw materials with care, and hold them over the tables provided at all times.
2. Do not wear open-toed shoes to class (including flip-flops, sandals, etc.). The floor may be littered with very small piece of debitage that will cut you, and artifacts have sometimes been dropped off the tables and onto toes—space in the lab will be provided for you to leave a pair of closed-toe shoes so you don’t have to continually carry a pair to and from class.

On KNAPPING PRACTICUM DAYS, please take the following additional precautions:

1. Wear appropriate clothing such as long pants (jeans work well), socks, and shoes which cover your legs, feet, and ankles, and a loose long-sleeve shirt that covers your forearms completely. Consider wearing old clothing that you don’t mind getting dirty or possibly damaged.
2. Wear safety goggles and leather gloves at all times (see Lab Equipment below).
3. Be awake and alert. You must not be groggy from lack of sleep or under the influence of over-the-counter or prescription medicines, alcohol, or other intoxicating substances.
4. Follow your instructor’s directions fully and exactly in order to avoid injury; students who disregard such instructions or other safety precautions will receive a failing grade in the course and be subject to disciplinary action.

Your instructor will provide basic first aid and bandages in case of injury, but more serious wounds may require the use of an ambulance service and/or hospitalization. You agree to participate in the course at your own risk. Neither your instructor, nor the University of Hawai‘i is responsible for any medical costs incurred by you that relate to injuries derived from your participation in this course. Check that your health insurer will cover any medical costs associated with injuries that might result from your handling of lithic artifacts or our knapping activities. If you have a medical condition that could imperil you if were cut (i.e. hemophilia) or those administering first aid (i.e. blood pathogens such as HIV/AIDS) inform your instructor immediately after class—such information will be held in the strictest confidence.

Lab Equipment

Lab equipment that is not provided by the University, but is required for participation in the flintknapping components of the course includes: (1) shatter-resistant plastic safety glasses; and (2) leather gloves (full leather gloves are preferable, but those with leather palms and tips are acceptable). Students are responsible for purchasing these items on their own and bringing them to class on the days specified. We will discuss in class where these items can be purchased locally and at minimal cost.

Laulima

A Laulima course shell has been created for our class. It is available online through the UH Laulima portal (https://laulima.hawaii.edu/portal) or via your MyUH page (log in at http://myuhportal.hawaii.edu/). Once registered you will be able to access certain class content online using your UH user ID and password. Copies of the course syllabus, readings, assignments, and other course documents in PDF format will be updated regularly. You will need Adobe Acrobat Reader to open, view, and/or print these documents (available free at http://www.adobe.com). Your instructor may use Laulima to post and/or email you important announcements such as readings additions/deletions, class cancellations, or scheduling changes. It is your responsibility to ensure that your UH email account is set to forward these announcements to the account you use most frequently (if different from the above) and that your UH inbox is emptied regularly.
**Academic Dishonesty**

You are encouraged to discuss what you have learned in this class with your peers (both in and out of the classroom). Each student is responsible, however, for the content of work submitted or presented as their own. Students caught plagiarizing authoritative sources, failing to acknowledge the ideas of others, copying and submitting another student’s work as their own, cheating, or conspiring to cheat on assignments or examinations and/or failing to follow lab safety procedures will face disciplinary action. Offences are outlined in the Student Conduct Code ([http://www.hawaii.edu/student/conduct](http://www.hawaii.edu/student/conduct)). Depending on the severity of the offence, sanctions may range from the receipt of lower or failing grades for the exam(s), exercise(s), or course in question to dismissal from the university without possibility of readmission. Severe infractions will be referred to the UH Dean of Students for disciplinary action.

**Disabilities and Special Needs**

Students with disabilities or in need of special classroom accommodations must contact the instructor and UHM KOKUA as soon as possible ([V/T] 956-7511 or [V/T] 956-7612; email: kokua@hawaii.edu). KOKUA is located on the ground floor of the Student Services Center, Rm. 103. Additional information is available online ([http://www.hawaii.edu/kokua/](http://www.hawaii.edu/kokua/)).

**Final Note**

This is a syllabus, not a legal contract. As such, it is a good-faith article outlining the expectations and obligations of the course. Dates, deadlines, readings, etc., are all subject to change or cancellation at the discretion of your instructor(s). I (or we) will endeavor to inform you in a timely manner of any changes to our schedule, either in person or by email. In the event that you are absent from class, or your inbox is full, the burden falls to you to consult your fellow students for updated information.
## Course Calendar

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<tr>
<th>DATE</th>
<th>TOPICS</th>
<th>READINGS/NOTES</th>
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<tbody>
<tr>
<td>Week 01</td>
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<tr>
<td>T 01/10</td>
<td>Introduction/Course Logistics/Lab Safety</td>
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<td>R 01/12</td>
<td>History of Stone Tool Research</td>
<td>Odell, pp. 1–12</td>
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<td>Week 02</td>
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<td>T 01/17</td>
<td>Lithic Procurement 1: Raw Material Types and Geomorphic Processes</td>
<td>Odell, pp. 13–24</td>
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<td>Luedtke (1994):5–15</td>
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<td>R 01/19</td>
<td>Dedicated In-Class Assemblage Analysis Time</td>
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<td>Week 03</td>
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<td>T 01/24</td>
<td>Lithic Procurement 2: Quarries &amp; Raw Materials Sourcing</td>
<td>Odell, pp. 24–42</td>
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<td>Ericson (1984)</td>
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<td>R 01/26</td>
<td>Tool Manufacture 1: Fracture Mechanics &amp; Flake Morphology</td>
<td>Odell, pp. 43–58</td>
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<td>Chase (1985)</td>
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<td>Lab Assignment 1 Handed Out</td>
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<td>Week 04</td>
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<td>T 01/31</td>
<td>Tool Manufacture 2: Flaked Stone Production &amp; Modification</td>
<td>Odell, pp. 58–74</td>
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<td>Lab Assignment 2 Due</td>
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<td>R 02/02</td>
<td>Tool Manufacture 3: Flintknapping in Practice</td>
<td>Whittaker (1994): Ch. 3</td>
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<td>Video: Flintknapping: Art of the Ancients</td>
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<td>Week 05</td>
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<td>T 02/07</td>
<td>Knapping Practicum 1: Core Preparation &amp; Basic Reduction</td>
<td>Whittaker (1994): Ch. 5</td>
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<td>Whittaker (1994): Ch. 6</td>
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<td>Lab Assignment 3 Due</td>
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<td>R 02/09</td>
<td>Knapping Practicum 2: Biface Production &amp; Thinning</td>
<td>Whittaker (1994): Ch. 8</td>
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<td>Week 06</td>
<td>T 02/14</td>
<td><strong>Knapping Practicum 3: Pressure Flaking</strong></td>
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<td>R 02/16</td>
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<td><strong>Knapping Practicum 4: Pulling It All Together</strong></td>
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| Week 07 | T 02/21 | **Assemblage Variability 1: Reduction Sequences** | Odell, pp. 87–103  
Kooyman (2000a):48–68 |
| R 02/23 | **Assemblage Variability 2: Lithic Refitting** | Morrow (1996)  
Larson and Kornfeld (1997)  
*Hiscock (1986)*  
Lab Assignment 4 Handed Out |

| Week 08 | T 02/28 | **Tool Manufacture 4: Ground Stone Artifact Production** | Odell, pp. 74–85  
| R 03/01 | **Assemblage Variability 3: Type-Variety Systems of Classification** | Odell, pp. 103–110  
Andrefsky (2005):61–85  
Kooyman (2000b):91–106  
Lab Assignment 4 Due  
Lab Assignment 5 Handed Out |

| Week 09 | T 03/06 | **Assemblage Variability 4: Comparing Assemblage Classes** | Odell, pp. 110–118  
TBA readings |
| R 03/08 | **Assemblage Variability 5: Typological and Attribute Analysis of Debitage** | Odell, pp. 118–130  
Sullivan and Rosen (1985)  
Prentiss and Romanski (1989)  
Morrow (1997)  
*Bradbury and Carr (1999)*  
Lab Assignment 5 Due  
Lab Assignment 6 Handed Out |

| Week 10 | T 03/13 | Dedicated In-Class Assemblage Analysis Time | -- |
| R 03/15 | Dedicated In-Class Assemblage Analysis Time | -- |
| Week 11  | T 03/20 | Assemblage Variability 6: Aggregate Analysis of Debitage | Odell, pp. 130–133  
Ahler (1989)  
Andrefsky (2007)  
*Lab Assignment 6 Due*  
*Lab Assignment 7 Handed Out* |
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<td>Dedicated In-Class Assemblage Analysis Time</td>
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<td>Week 12</td>
<td>T 03/27</td>
<td><strong>NO CLASS: SPRING BREAK</strong></td>
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<td>R 03/29</td>
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<td><strong>NO CLASS: SPRING BREAK</strong></td>
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| Week 13 | T 04/03 | **Tool Function**: Use-Wear and Residue Analysis          | Odell, pp. 135–173  
Adams (2002):27–41  
*Lab Assignment 7 Due*  
*Lab Assignment 8 Handed Out* |
| R 04/05 |         | **Behavioral Inferences 1**: Technological Organization: Tool Design & Raw Material Availability | Odell, pp. 175 & 190–202  
Bleed (1986)  
Andrefsky (1994)  
*Lab Assignment 8 Due* |
| Week 14 | T 04/10 | **Behavioral Inferences 2**: Technological Organization: Relative Mobility | Shott (1986)  
Parry and Kelly (1987)  
Tomka (2001) |
| R 04/12 |         | **Behavioral Inferences 3**: Subsistence, Sedentism, and the Spatial Organization of Activities | Odell, pp. 176–190  
Adams (1999)  
Keeley (1991)  
Pearsall et al. (2004) |
| Week 15 | T 04/17 | **Behavioral Inferences 4**: Specialization & Social Differentiation | Odell, pp. 202–207  
Arnold (1992)  
Aldenderfer et al. (1989)  
Haines et al. (2004) |
| R 04/19 |         | **NO CLASS: Instructor at SAA Meetings**                  | --                  |
| Week 16 | Behavioral Inferences 5: Resource Control | Odell, pp. 207–214  
Torrence (1984)  
Nassaney (1996)  
Hayden et al. (1996) |
|--------|------------------------------------------|--------------------------------------------------|
Aoyama (1994)  
Pope and Pollack (1995)  
Weisler and Kirch (1996) |
| R 04/26| **FINAL EXAM (In-Class)**                | --                                               |
| Week 17|                                          |                                                  |
| T 05/01|                                          |                                                  |

*For consultation during associated assignment.*