Anthropology 471/571: ZOOARCHAEOLOGY
Spring 2015 - Dr. Madonna L. Moss

Time & Place: 10:00-11:50 am, Mondays, in 264 Condon Hall
10:00-11:50 am, Wednesdays, in 313 Condon Hall
Open Lab: 2:00-4:00 pm, Fridays, starting Week 4 in 264 Condon Hall.

Professor Moss's Contact Information:

<table>
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<tr>
<th>Telephone: 541.346.6076</th>
<th>Office: 327 Condon</th>
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<tbody>
<tr>
<td>email: <a href="mailto:mmoss@uoregon.edu">mmoss@uoregon.edu</a></td>
<td>Office Hours: Friday, 2:00-3:00 pm</td>
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Course Description
The main goals of this class are to:

1. provide you with hands-on experience in the practical skills of working with comparative collections and zooarchaeological assemblages.
2. allow you to become informed consumers of archaeological literature involving the study, analysis, and interpretation of zooarchaeological assemblages.

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. Studies of vertebrate and invertebrate remains can inform a wide variety of archaeological topics. The bone and shell debris in archaeological sites are the remains of animals people used for food, and whose products were used to make clothing, shelter, and other artifacts. Faunal remains are valuable sources of information on past environments and the ways humans participated in their ecosystems. Certain species are sensitive environmental and/or seasonal indicators and can be used to draw inferences about past environments in the vicinity of a site during the periods or seasons it was occupied. Faunal studies can reveal significant differences in the distribution and abundance of different species in the past. Such studies can be of interest to fisheries and wildlife biologists and managers working to understand contemporary ecological relationships. Faunal remains from archaeological sites are a primary source of information on the structure of past economies, subsistence practices, and land and resource use. Types and distributions of faunal remains can be used to understand the relative economic importance of various animals, the organization of activities at a site, the degree of sedentism or duration of an occupation, or the effects of human use on local animal populations. In comparative studies, archaeologists may discern differences in the composition, taxonomic diversity, and fragmentation of faunal assemblages resulting from both natural and cultural factors. Archaeologists also use faunal remains as a source of information to understand site formation processes. Higher order interpretations based on zooarchaeological studies have been key components of new insights on the nature of human-animal interactions, including new ideas about early hominin lifeways, the timing and evolution of hunting, the peopling of the Americas, Pleistocene extinctions, global climate change, and many other topics.

The two course goals listed above are interrelated; you will understand the zooarchaeological studies you read much better after you have accumulated some experience doing zooarchaeological analysis yourselves. This course will give you hands-on, practical experience as an introduction to zooarchaeology. We study the fundamentals of how archaeologists proceed from recovered bones and shells to inferences about human behavior. We trace the stages from field excavation to laboratory processing, recovery and sampling decisions, identification, and various kinds of analyses, through quantification, analyzing, and reporting faunal data. Sometimes faunal studies are central to archaeological research topics, and sometimes they are not. However, zooarchaeological studies have significant potential to inform larger research issues, and this potential is not always realized. Sometimes the results of faunal analysis are not fully integrated into archaeological reports, and other times the results are mis-used or mis-interpreted. A large number of zooarchaeological publications focus on methodological issues; understanding the limitations of various methods allows you to critically evaluate archaeological inferences based on zooarchaeological data.

Proficiency in faunal analysis is a long-term endeavor requiring years of effort, sustained practice, as well as comprehensive comparative material from your area of study. It can be tedious and frustrating work, and requires both patience and perseverance. It can also be fascinating and fun. By the end of the term, you will have worked
with the remains of shellfish, fish, birds and mammals and used comparative collections to make identifications. Most of us will have analyzed and interpreted numerical data to understand human use of animals as well as non-human factors which structure faunal assemblages. These skills should make it easier to appreciate the methodological literature, help you decipher faunal data in published sources, and allow you to evaluate interpretations of patterning in faunal data. The practical experience will also help you appreciate the many logistical and analytical problems involved in zooarchaeology.

**Learning Outcomes**

1. learn some of the basic skills involved in the processing of bulk samples from a coastal archaeological site.

2. gain experience in identifying bulk sample constituents including shell, bone, charcoal, vegetal remains, non-cultural lithics, etc.

3. learn how to use the UO Department of Anthropology North Pacific Comparative Collection.

4. learn how to identify different classes of vertebrate remains, specifically to develop the skill to distinguish fish, bird, and mammal bones.

5. increase identification skill and knowledge of vertebrate anatomy by converting an animal carcass (of a bird or fish) into a skeletal specimen for the North Pacific Comparative Collection.

6. learn how to identify skeletal elements from fragmentary remains.

7. learn how to identify different taxa of fish, birds, and mammals to family, genus, or species using published guides and the North Pacific Comparative Collection.

8. gain knowledge of the basic quantitative units and analytical approaches of zooarchaeology and learn how to decipher and understand both tabular data and graphical presentations.

9. learn how to read the archaeological literature that addresses zooarchaeological questions, to understand the relationship between research question(s), methods, primary and secondary data, analytical procedures and interpretation. Taking all of these together, learn how to critically evaluate the clarity, validity, and cogency of zooarchaeological arguments.

10. learn how to record and present primary zooarchaeological data and gain experience in summarizing primary data and generating some types of secondary data.

11. by participating in a problem-oriented research project, better understand the process of generating original data from a specific set of archaeological materials and taking those data through some stages of the research cycle.

12. by participating in a problem-oriented research project, gain experience in conducting background research (in the library and on the internet) relevant to various stages of the zooarchaeological analysis process.

**Required Texts and Supplies:**

Blackboard Readings


You should plan on doing a considerable amount of additional outside reading relevant to your lab projects.

Required (additional) Text for ANTH 571:

Course Format - This class is designed for advanced undergraduates and graduate students, and is both seminar and laboratory. During about half of the class meetings (9 of 10 Wednesdays), we'll discuss the readings. I expect everyone to come to class well-prepared for discussion; bring the readings to class so we can refer to them, and come with questions and comments. The other class meetings involve laboratory work. On Fridays starting in Week 4, you will have the opportunity for additional lab time to work with the archaeofaunal assemblages assigned to you. Individuals will work as members of 2-4-person teams on the faunal remains from specific sites in Alaska and Oregon. Work in the lab during additional hours may be necessary to complete your lab projects. If your schedule precludes your ability to work during lab hours, you should either arrange another time to work in the lab (or re-consider taking this class).

Zooarchaeology involves precision in record keeping and data management as well as quantitative skills. Some of the reading is technical. Since we work with actual specimens, zooarchaeology students must be able to closely follow instructions, handle materials carefully, work with numerical data, and have some elementary knowledge of algebra, mathematical problem-solving, and statistics.

Those of you who know me already know that I expect each student to attend every class. If you are sick with a contagious illness or have another legitimate excuse, please notify me as soon as possible. As a rule in my courses, missed classes result in lower grades. Do not schedule appointments or make any other commitments during class time.

You have 10 weekly writing assignments, due on Wednesdays.
For four Wednesdays, (4/1, 4/8, 5/6, 5/13), you submit a Reading Response Paper by 8 am (see below). For six Wednesdays, you bring your written work to class:

workheets due on 4/15, 4/22, 4/29, or
project-related assignments due on 5/20, 5/27, 6/3.
The **Reading Response Paper** is due before class so I can read them ahead of class. To “jump-start” discussion, alert me as to where your interests lie, and to help identify those portions of the text requiring special attention, you are required to write a one-page, single-spaced reading response paper. This can take the form of questions raised by the day’s readings, places in the text where you would like clarification, a discussion of topics worth special attention, or a critique or critical commentary on the assigned readings. Send these assignments to me by email no later than 8 am on the Wednesday on which they will be discussed in class. I am happy to read assignments on Tuesday nights, so feel free to turn these papers in early.

No late assignments can be accepted.

Part of the participation grade will be responsible behavior and record-keeping in the lab. Students are required to contribute to the lab notebook for their project. These lab notes will document the on-going progress of the laboratory research. These notes are hand-written, but they should be easy to read (in other words, please write neatly and legibly). Laboratory notes should be kept up-to-date on a daily basis (i.e. for each day on which lab work is conducted). Lab notebooks should remain in Condon 264. These notes should document the actual work accomplished, problems encountered, and outside sources pursued to address issues related to laboratory projects.

**Grading of Undergraduate Students** - Grades will be based on a percentage of 300 possible earned points.

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<th>Attendance &amp; Participation</th>
<th>on-going</th>
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<tr>
<td>4 Reading Response Papers</td>
<td>due on dates listed above</td>
<td>40</td>
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<tr>
<td>3 Worksheets based on Chapters, 4, 5, 6</td>
<td>due on dates listed above</td>
<td>30</td>
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<tr>
<td>3 Project-related written assignments</td>
<td>due on dates listed above</td>
<td>30</td>
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<td>Preparation of Skeletal Specimen</td>
<td>due 5/4</td>
<td>25</td>
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<td>Final paper/project report</td>
<td>due 6/10</td>
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<td>Peer evaluation</td>
<td>due 6/10</td>
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**Graduate Student Requirements and Grading**

Graduate students are expected to show leadership in helping manage the lab work. I am hoping that you will serve as mentors to the undergraduates in your group. On the other hand, I expect undergraduates to behave responsibly and fully contribute to the work. Grad students will coordinate the final laboratory project report of the team of which they are a member. Graduate student team leaders will work together with undergraduates to put together high-quality information, analyses, and interpretations.

Over the course of the project, graduate students will help identify and distribute additional reading related to the specific laboratory projects. These readings may be methodological, biological, ecological, culture historical, ethnographic, or ethnoarchaeological in orientation.

**Laboratory Projects** - The lab project involves the actual analysis of some aspect of a faunal assemblage from a specific archaeological site or museum collection. Each team will be assigned an assemblage to work with by the second or third week of class. Team members will be collectively responsible for dividing up the labor equitably. The lab work will occur in stages, and each team's assemblage will be suited to specific kinds of analyses. Starting in Week 4, I will be available on Friday afternoons in the laboratory, and you may arrange to work in the laboratory at other times. You are expected to do outside reading relevant to topics related to your assemblage, and here again, you may want to divide the labor. In this class, I want to emphasize the analysis of the assemblage at hand, as opposed to an extensive literature review of a topic that may be tangentially related to your project. Your final project report will present the data, analyses, and interpretations within the context of the field of zooarchaeology. A number of “milestones” to track your progress on the project are built into the class schedule. These include:

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<th>Maintaining Lab Notebook</th>
<th>on-going and 5/18</th>
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<td>Submit draft primary data worksheets, table outlines</td>
<td>due 5/11</td>
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The project status report due on 5/27 shall include the following components:
- list of research questions
- list of data to be used to address questions
- assessment of how much has been accomplished to date (numbers of samples analyzed, etc.)
- description of how labor is allocated among individual team members
- brief description of any problems encountered

Project status reports will be ~5 pages. I intend to provide specific feedback on this report as rapidly as I can, so as
to insure the execution and completion of a solid final paper. The length of final papers will vary depending on the
number of team members and the various components of the project. Final reports will include spreadsheets and
tables presenting zooarchaeological data you have generated (paper and electronic copies).

Disability - If you have a documented disability and need accommodation, please contact me soon. Please also
request that the Counselor for Students with Disabilities send a letter verifying your disability.

Academic Dishonesty - Students caught cheating or plagiarizing will receive a "0" for that particular assignment or
exam, and the incident will be reported to campus authorities. Plagiarism includes, but is not limited to: (a) the
knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person
without full and clear acknowledgment; and (b) the knowing or negligent unacknowledged use of materials prepared
by another person or agency engaged in the selling of term papers or other academic materials.

Classroom / Office Courtesy - Please follow these guidelines to avoid disrupting the class:
- Turn off cell phones before arriving.
- Do not arrive late or leave early (except for a bathroom break or emergency).
- Do not sleep during class, do not eat in the lab.
- Do not work on other assignments during class or lab.
- On most days, you shouldn’t need your laptop in the classroom or lab.

Missed-Class Policy – I cannot re-teach the course outside of lecture or lab; I am happy to answer questions, clarify
content, and provide guidance for those who attend class and come in with informed questions after they have
attempted the work themselves. Students who miss class must secure notes and other materials from another student
in the class.

More Legalities: I have recently been informed that we are now required to include specific language on syllabi that
prohibits unauthorized use of course materials. I am sorry things have deteriorated to this point.

Material on the Blackboard site is for your use in this class. It is not for posting or sale. Materials written by your
instructor are the instructor's (or in some cases the UO's) intellectual property. It is important that everyone respect
each other's rights. For instance, you should not copy and redistribute course materials without my permission. I
may also post other copyrighted materials on the course site. It is my responsibility for ensuring that such posting
does not violate copyright law, but you should be aware that you do not have the right to make additional copies or
redistribute these materials.
Assemblages from the following sites will be analyzed:

1. The Chetco Indian village of Tcetxo (35-CU-42) is located on the Port of Brookings Harbor property in southern Oregon. The port’s commercial receiving dock was extensively damaged by a tsunami in March 2011 and required extensive repairs. Before this was done, Heritage Research Associates excavated some backhoe trenches and test pits and recovered a variety of remains from the remnant shell midden, dated to 2000-1300 years ago. Ricks (2012) analyzed over 25,000 vertebrate faunal remains, most of which were fish. Rockfish was the most common taxon; greenlings, striped surffish, and salmonid were also abundant, and lingcod, hake, surffish, cods, sculpin, herring, buffalo sculpin, starry flounder, and cabezon were also identified. With the exception of salmonid which could have been caught farther upriver, the fish taxa represented are typical of estuarine and near-shore environments, like that adjacent to the site. A number of bulk column samples were excavated from the site, but were never processed. As a class, we are going to screen these samples and retain the fines larger than 2 mm in size. From these we will sort out identifiable fish bone. We will identify the fish bone in these samples for the purpose of identifying any taxa that were not previously identified by Ricks (2012). For example, we know that the northern anchovy (Engraulis mordax) has been identified as an important fishery in the Chetco River estuary (Gaumer et al. 1973:12, 14), even though it has not yet been identified from CU-42. There also may be herring, smelt, or other small fish present.

2. The bird bones from five archaeological sites (49-DIX-53, 54, 55, 62, 63) on the Forrester Islands in southeast Alaska have been identified to taxon (Moss 2007). These assemblages represent birds used by Tlingit and Haida. Recently, Sloan (2013; 2015) revisited a collection of bird bones previously analyzed by Moss (Moss and Bowers 2007). The project below involves following Sloan’s protocol for recording element part and cultural modification to glean additional information from the birds from these sites.

1. These assemblages will be re-visited to record additional information to help us understand how birds were butchered, cooked, consumed, processed for feathers or skins, and bones used to make bone tools.
2. The work will involve recording more details about the portions of elements recovered, the nature of breakage, and the type of modification. There may be variability in how birds were treated depending on species, size, and cultural practices.
3. Students will follow the protocols outlined by Sloan (2013) to record and analyze element portion and breakage data.
4. Ethnographic literature may helpful in interpreting the patterns we find.

3. In the 1960s and 1970s, George Phebus, Jr., and Robert Drucker conducted excavations in Seaside, Oregon, at three archaeological sites: Par-Tee site (35-CLT-20; A.D. 300-1150),
Avenue Q site (35-CLT-13; A.D. 400-1000), and Palmrose (35-CLT-47; 800 B.C. to A.D. 300). These were rapid excavations, without much control but at least some of the material has been curated at the Smithsonian Institution since 1984. This material was recently inventoried and organized by Hannah Wellman. To accommodate changes to Interstate Highway 101, in 1988, Tom Connolly and a crew from the UO Museum of Anthropology did some controlled excavations at Palmrose and Avenue Q (Connolly 1992; 1995). Since then, working with the Smithsonian collections, Colten (2002) looked at a small proportion of the faunal remains and Losey analyzed artifacts and other materials from Par-Tee (http://www.ualberta.ca/~riosey/partee/tools.htm). Losey has also published a paper on evidence for whale hunting at the site (Losey and Yang 2007). However, an unknown proportion of materials from these sites has remained in private hands until recently (2014), when they were acquired by the University of Oregon Museum of Natural and Cultural History. A tremendous quantity of materials are now stored in the Museum’s “Prep Lab,” located near the Autzen Footbridge. For her Master’s project, Hannah is conducting a study of the sea otter bones from Palmrose and Par-Tee to take measurements from teeth that can be used to reconstruct sea otter body size. This information will be compared to earlier work by R. Lee Lyman (1988), who suggested that Oregon’s sea otters differed in size from both Alaska and California sea otters. Such studies are important because efforts to re-introduce sea otters into Oregon waters have been unsuccessful so far, perhaps because of genetic differences (Valentine et al. 2008). Students working on this project will go through all the materials from Palmrose, looking for sea otter bones. They will assist Hannah in recording metric data (from teeth) that can be used to better document sea otters in Oregon.

4. MNCH collection project – Al Hoffman graduated from Oregon Normal School, known today as Western Oregon University. He and his wife Martha lived in rural Alaska for many years where they were teachers. They taught in Dillingham, King Cove, Ruby, Old Harbor, and St. Paul Island. At the time of the 1964 Alaska earthquake, they were living in Old Harbor on Kodiak Island, and had to head for higher ground to escape the tsunami. They left Alaska in 1975. After his death in 2010, a collection (mostly marine mammal teeth and some other elements) made by Al Hoffman was donated to the Jensen Arctic Museum at Western Oregon University. Most of these materials were collected on St. Paul Island (one of the Pribilof Islands) sometime before 1964. In 2012, Western Oregon University decided to dismantle the Jensen Arctic Museum. The Jensen collection was transferred to the UO Museum of Natural and Cultural History (MNCH) in August 2013, and the physical transfer of materials was completed just last year (October, 2014). These materials are also of special interest because the Pribilof Islands are home to the largest northern fur seal (Callorhinus ursinus) breeding area in the world, and we suspect that many of the materials collected by Hoffman are from northern fur seals. Our first task is to do some basic identifications to assist the Museum in knowing what they have.

1. What teeth are represented?
2. What species are represented?
3. How many individuals are represented?
4. What research potential does this collection have?
5. Do these materials have value for local communities?

Other projects we may work on:
a) washing and sorting some fish and bird remains from **Rice Ridge** (49-KOD-363), a middle Holocene site located on Kodiak Island, currently being studied by graduate student Molly Casperson and her assistant Chelsea Buell.

b) measuring a sample of mussels (*Mytilus californianus*) from **Cape Addington Rockshelter** (49-CRG-188) to reconstruct their size and understand the ecological effects of sea otter predation; following the lead of McKechnie and Singh's 2015 paper in *Journal of Archaeological Science*, "Making the Most of Fragments: A Method for Estimating Shell Length From Fragmentary Mussels (*M. californianus* and *M. trossulus*) on the Pacific Coast of North America." McKechnie is currently a post-doctoral fellow at the UO working with Dr. Moss.

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<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tr>
<td>3/30</td>
<td>Introduction &amp; requirements, working with comparative collections, introduction to lab projects</td>
<td>Initial orientation to course &amp; lab, Zooarchaeology Laboratory Protocols</td>
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<tr>
<td>4/1</td>
<td>Zoarchaeology History &amp; Theory</td>
<td>Reitz &amp; Wing, Appendix 3 (pp. 377-395); Ch. 1-2 (pp. 1-30)</td>
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<td>4/6</td>
<td>Lab #1 - Mammals</td>
<td>Driver 2011a, 2011b</td>
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<td>4/8</td>
<td>Basic Taxonomy, Systematics, Anatomy</td>
<td>Reitz &amp; Wing, Ch. 3 (pp. 31-47)</td>
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<td>4/15</td>
<td>Lab #2 - Birds</td>
<td>Serjeantson 2009-8-34, Chapter 4 worksheet will be distributed.</td>
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<td>4/20</td>
<td>Ecology</td>
<td>Reitz &amp; Wing Ch. 4 (pp. 88-116); review Moss 2004; Chapter 4 worksheet due</td>
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<td>4/22</td>
<td>Disposal and recovery</td>
<td>Moss &amp; Cannon 2011; Chapter 5 worksheet will be distributed.</td>
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<td>4/27</td>
<td>Lab #4 - Processing Column Samples</td>
<td>Minor 2012: ii-iii, 1-9, 18-20, 81-93. Start using lab notebooks in today's class. Chapter 6 worksheet distributed.</td>
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<tr>
<td>4/29</td>
<td>Gathering Primary Data</td>
<td>Reitz &amp; Wing, Ch. 6 (pp. 153-181); review Moss (2004); Chapter 6 worksheet due</td>
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<td>5/4</td>
<td>Lab #5 - Skeletal Specimen Due in Class</td>
<td>Curation, SPECIFY. Project background reading assigned.</td>
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<td>5/6</td>
<td>Gathering Secondary Data</td>
<td>Reitz &amp; Wing, Ch. 7 (pp. 182-250) undergrads: pp. 182-224, 233-250</td>
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<td>5/11</td>
<td>Lab #6 - Project Work</td>
<td>Project background reading; Groups primary data worksheets, table outlines and what secondary data they will generate.</td>
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<td>5/13</td>
<td>Human as Predators, Past Environments</td>
<td>Reitz &amp; Wing, Chs. 8 (pp. 251-286) and Ch. 10 (pp. 316-334)</td>
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<td>5/18</td>
<td>Lab #7 - Project Work</td>
<td>Review Moss (2004) to see how research questions (Ch. 1, 9, 10, 11) articulate with data generated and analyzed; Lab notebook review.</td>
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<td>5/20</td>
<td>Conclusion to textbook, review project status</td>
<td>Reitz &amp; Wing, Ch. 11 (pp. 335-351); groups submit project bibliography</td>
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<td>5/25</td>
<td>Memorial Day – No class</td>
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<td>5/27</td>
<td>Lab #8 - Project Work</td>
<td>Project reading; groups submit written 5-page project status report</td>
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<td>6/1</td>
<td>Lab #9 - Project Work – share results in lab</td>
<td>Project reading</td>
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<td>6/3</td>
<td>Course Wrap-up – Student Progress Reports</td>
<td>groups present powerpoint presentations (including graphical data)</td>
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<td>6/10</td>
<td>Final Papers, Peer Evaluations Due 5:00 pm</td>
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