Anthropology 3510: Human Osteology
Mon / Wed 6:00 – 7:40 pm, Moore Hall G0115

Instructor: Dr. Jacqueline Eng
Office: Moore Hall 1045
Office Hours: M 1-2pm, W 2-3 in office and Th 3-4:30 in G0115 lab (or by appointment)
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Course Description and Goals:
In this hands-on laboratory course, we will take an in-depth study of the human skeleton as a dynamic, living system. We will examine each bone, with a review of normal and abnormal variations. In the course of this examination, we will cover bone biology, growth and development, and anatomy. You will learn how to record osteological observations and apply this knowledge to make determinations about age, sex, stature, and pathological conditions. We will also discuss how these data are used in the anthropological interpretation of historic and prehistoric patterns of health, disease, stress, and trauma, as well as discuss ethical considerations in studying human remains. Much of the course will be based on handling real human bones, so be prepared (and be gentle with material)!

Prerequisite: Anth 2500 Intro to Biological Anthropology (or equivalent)

Required Texts*/Readings:
3) Pdf articles as announced in class and posted on Course Reserves (http://loan.library.wmich.edu/ares/ares.dll). Password is: osteology. Look for announcements on the e-learning class page about supplemental readings or changes.

*Bring texts to each class, particularly the Human Bone Manual. Do the assigned readings by the lecture date assigned.

Class Website: on e-learning (after logging onto GoWMU, click on the green “e” button on top right). Announcements, sample burial reports, and handouts will be posted, and students must check regularly.

Grading:
Attendance & Participation 15% - 60 points = 60 pts
Sketches (4 assignments) 10% - 10 points each = 40 pts
Labs (5) 25% - 20 points each = 100 pts
Quizzes (4) 30% - 30 points each = 120 pts
Burial Report 20% - 80 points = 80 pts
Total points for course grade: 400 points
Attendance & Participation: Regular attendance is mandatory and will benefit your understanding of concepts and class performance. Note, that this class will be part lecture/discussion and part lab time, and under NO circumstances can you leave early during lab time – the more time you have handling the bones, the more familiar will you become with all the features, which is why I also recommend attending the extra office hours for lab. I will count it as an absence if I note you have left class early.

Be on-time and be prepared for class, and do assigned readings so that you actively participate, especially on days where “Discussion” is listed on the class schedule. For these discussions, a pair of students (see sign up sheet) will be in charge of preparing at least 6 questions (three per person) to generate discussion during these periods, via listed pdf articles located in course reserves. They will post these questions before class (at least 1 full day) under the appropriate discussion thread in e-learning so students can view them. On discussion day, the pair will briefly (under 5min each!) summarize highlights of their article and pose the questions to classmates and facilitate discussion. You are graded based on 1) your preparedness as a pair discussion leader, including posting questions in a timely manner (5%); and 2) how you contribute to discussion when not a leader as well as by regular attendance (10%).

You can miss 2 classes without penalty, but after the second missed day, each additional unexcused absence will result in the lowering of your final points by 20pts (5% of grade). You must provide written documentation (e.g., signed by a medical doctor), explaining absences. More than 5 unexplained absences will result in a failing grade for the class. It is in your best interest to attend all classes as it is the only opportunity to study skeletal material for quizzes and your burial report, as well as do the labs, turn in assignments, and participate in discussion.

Sketches: Use a folder to hold drawings of skeletal remains. Every two weeks, starting with the fourth week, submit your folder with drawings of four different elements studied within the past two weeks. Each element should be labeled with at least 10 major landmarks (e.g., label so an observer could side left/right, anterior/superior, proximal/distal, muscle attachments, foramina, etc.). You don’t have to be a great artist or draw to exact scale, but the element must be recognizable. Use a real bone as your model so you note the variation from “ideal” bones shown in anatomy books. This skill is useful for field purposes and also helps you remember elements and their features. You’ll end up with 16 sketches by the end, each worth 2.5 points.

Labs: There will be five lab exercises, each worth 20 points. These labs will focus on practicing osteological methods and techniques presented in lecture. They are due at the end of the class meeting (except for Lab 5), with NO make up lab exercises.

Quizzes: Evaluations of your grasp of class concepts will be obtained through four short quizzes, each worth 30 points (7.5%). Quizzes are administered at the beginning of class (don’t be late!) and are timed. Each quiz will consist of bone identification (even fragmentary bone), identification of diagnostic features, and data recording where appropriate. Quiz items/questions are posted in individual “stations” and you are not to jump ahead your station until I announce time to move. There are NO make up exams. There will be an optional “Quiz 5” given on Wed of Week 13. It will constitute all the material taught thus far so is the most comprehensive of quizzes, but also worth 30points. If you opt to take this final quiz, I will count the best 4 out of the 5 quizzes in tallying up your grade. Quiz material terms can refer to White & Folkens terms or those I provide in handouts. Correct spelling is important!
What will NOT be tested:
- Those features *not* listed on book or handouts
- Muscles that go with insertion/origin
- Ossification centers
- Type of faunal remains

**Burial Report:** Within the first few weeks of class you will partner up with a fellow classmate and be assigned a burial to analyze for the remainder of the semester during days assigned in class and open lab/office hours. See below for the report guidelines. Worth 80 points (20%).

Burial reports are due by the day after our technical “Final Exam” day (4/25), so due on **Tuesday 4/26, by 10am** in my office. Late papers will receive point deductions with 10 points deducted if received after 10am on the due date, and an additional 15 points deducted if late full day. No papers will be accepted if later than 2 days (no papers after April 27) and no papers may be emailed or faxed; it is your responsibility to get your final paper in on time, in my hands. Feel free to submit drafts for my review or to turn in your paper early.

**Guidelines for Burial Report**

This paper will give you a chance to write a technical report such as an osteologist might be expected to write for a museum (for repatriation) or a cultural resource management firm. You will work with a partner to write this paper, due by the date and time listed above. Some burials include skulls, which requires more time, but yields more information. Be sure to work with your partner to divide work and find time to compare notes. Make photocopies of the appropriate data forms found at the end of *Standards* book to record your data. Check for interobserver error!

Papers must be typed, double spaced, with 1” margins, and checked for spelling and grammatical errors. Include proper citations in text and a reference section at the end. In your appendix, include summary tables (as found in the *Standards* book) for inventory, metrics, stature, and photographs of relevant pathological conditions or significant findings. All reports should follow the structure listed below (and as seen in a representative burial reports posted on the e-learning class website).

**Introduction:** Give the context of the burial material, i.e., location and any known provenience or associated reports and material artifacts (note that your burials generally lack this information). It is a good idea to give a brief overview of how the rest of the paper will be organized.

**Condition of bones:** Preservation, notable postmortem damage, etc.

**Age:** Methods used (cite), elements observed, age range from various sources of observation.

**Sex:** Methods (cite), which elements observed, and summary determination.

**Stature:** Bones measured and formula(e) used (cite) – justify why such formula(e) used.

**Pathology:** any observed, including possible cause of death. Record the presence/absence of the condition, noting severity and its relation to the sex and age of the individual.

**Conclusion:** Sum up the findings.

**References:** At the end of the paper include a bibliography of all of the references cited to in your paper. Use the format for references set out by APA (writing style guides: http://www.wmich.edu/library/helpguides/style.php).

**Appendix:** Include data tables (summarizing *Standards* type of data collection) and figures (photographs scaled to fit – black and white is fine).
# COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Class Topic</th>
<th>Reading</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10-Jan</td>
<td>Introduction: course topics, lab procedures; Anatomical terms</td>
<td>WF 1, 6; (e) Burns; Landau &amp; Steele</td>
<td>Osteology refresher</td>
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<tr>
<td></td>
<td>12-Jan</td>
<td>Bone Biology and Function</td>
<td>WF 4; BU p.3-5; (e) Bass; Ortner (optional)</td>
<td>Lab 1: Inventory &amp; Bone Biology</td>
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<td>2</td>
<td>17-Jan</td>
<td>MLK Holiday: No Class</td>
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<td></td>
<td>19-Jan</td>
<td>Bones of Skull I</td>
<td>WF 7</td>
<td>Sign up discussion</td>
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<td>3</td>
<td>24-Jan</td>
<td>Bones of Skull II</td>
<td></td>
<td></td>
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<td></td>
<td>26-Jan</td>
<td>Sex and Age of the Skull</td>
<td>WF19 (p.359-364, 385-389); BU p.15-16; 19-20;32-36</td>
<td>Lab 2: Age/sex skull</td>
</tr>
<tr>
<td>4</td>
<td>31-Jan</td>
<td>Quiz 1; Skull: Metrics, Biological affinities</td>
<td>WF 19 (p.400-411); BU p.69-78</td>
<td>Sketches 1 due</td>
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<td></td>
<td>2-Feb</td>
<td>Dentition: Morphology and Development; Sex &amp; Age; Variation</td>
<td>WF 8; 19 (p.364-368); BU 5, 6</td>
<td>Assign burial pairs</td>
</tr>
<tr>
<td>5</td>
<td>7-Feb</td>
<td>Diet; Diseases affecting skull</td>
<td>WF 17, 19 (p.411-414); (e) Lewis; Larsen (2006- agric)</td>
<td>Discussion 1</td>
</tr>
<tr>
<td></td>
<td>9-Feb</td>
<td>Vertebrae, Sternum, Ribbs</td>
<td>WF 9-10</td>
<td></td>
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<tr>
<td>6</td>
<td>14-Feb</td>
<td>Diseases affecting vertebrae &amp; ribs</td>
<td>(e) Rogers&amp;Waldron; Lambert</td>
<td>Discussion 2; Sketches 2 due</td>
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<tr>
<td></td>
<td>16-Feb</td>
<td>Quiz 2; Clavicle, Scapula</td>
<td>WF 11</td>
<td></td>
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<tr>
<td>7</td>
<td>21-Feb</td>
<td>Humerus, Ulna, Radius</td>
<td>WF 12</td>
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<tr>
<td></td>
<td>23-Feb</td>
<td>Carpals, Metacarpals, Phalanges</td>
<td>WF 13</td>
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<tr>
<td>8</td>
<td>Spring Break 2/28-3/4</td>
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<td></td>
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<tr>
<td>9</td>
<td>7-Mar</td>
<td>Quiz 3; Bones of the Pelvis</td>
<td>WF 14</td>
<td>Sketches 3 due</td>
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<tr>
<td></td>
<td>9-Mar</td>
<td>Pelvis: Sex and Age</td>
<td>WF 19 (p.374-85, 393-398); BU 3</td>
<td>Lab 3: Age/sex os coxae</td>
</tr>
<tr>
<td>10</td>
<td>14-Mar</td>
<td>Limb growth and malformations</td>
<td>(e) Ortner &amp; Mays; Weinstein</td>
<td>Discussion 3</td>
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<tr>
<td></td>
<td>16-Mar</td>
<td>Femur, Patella, Tibia, Fibula</td>
<td>WF 15</td>
<td>Burial analysis</td>
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<tr>
<td>11</td>
<td>21-Mar</td>
<td>Long bone metrics; Height</td>
<td>WF 19 (p.398-400); BU p.79-84</td>
<td>Lab 4: Metrics; Sketches 4 due</td>
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<tr>
<td></td>
<td>23-Mar</td>
<td>Tarsals, Metatarsals, Phalanges</td>
<td>WF 16</td>
<td></td>
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<tr>
<td>12</td>
<td>28-Mar</td>
<td>Diseases of the limbs and joints</td>
<td>(e) Judd &amp; Roberts; Jurmain</td>
<td>Discussion 4</td>
</tr>
<tr>
<td></td>
<td>30-Mar</td>
<td>Quiz 4; Burial report update</td>
<td>WF 18</td>
<td>Burial analysis</td>
</tr>
<tr>
<td>13</td>
<td>4-Apr</td>
<td>Field Procedures</td>
<td>WF 2; (e) Buzon et al.; Powell</td>
<td>Burial analysis</td>
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<tr>
<td></td>
<td>6-Apr</td>
<td>Ethics in Osteology</td>
<td>WF 3; (e) Walker, Rose et al.</td>
<td>Discussion 5; Lab 5: Photographing</td>
</tr>
<tr>
<td>14</td>
<td>11-Apr</td>
<td>Postmortem Modification</td>
<td>WF 5; BU 9</td>
<td>Burial analysis</td>
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<tr>
<td></td>
<td>13-Apr</td>
<td>(optional) Quiz 5; Film</td>
<td></td>
<td>Burial analysis</td>
</tr>
<tr>
<td>15</td>
<td>18-Apr</td>
<td>Paleopathology</td>
<td>BU 10; (e) Goodman &amp; Martin; Angel</td>
<td>Discussion 6</td>
</tr>
<tr>
<td></td>
<td>20-Apr</td>
<td>Bioarchaeology</td>
<td>(e) Larsen (bioarch); Wood et al.</td>
<td>Discussion 7</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td><strong>Finals Week: Burial report due by 10am, Tues April 26</strong></td>
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WF= White & Folkens Bone Manual; BU= Buikstra & Ubelaker Standards; (e) = e-Course Reserves

Note: This syllabus is subject to change: any changes to the syllabus or readings will be announced in class/online. You are responsible for knowing dates of quizzes and due dates for assignments and readings, especially related to discussion.
Introduction to the Lab

A. Locations of reference materials (facing back wall from Right to Left)

1. Gray cabinet (Burials 1, 2, 10, 11, 13, 14, 15). Calipers.
   a. Top 2 shelves have most axial elements (vertebrae, ribs, pelves)
   b. Next 2 rows have upper limb and shoulder elements
   c. Bottom 2 rows have lower limb elements

2. Brown cabinet (Burials 16, 17)
   a. Left column top shelf: miscellaneous casts for sex and age
   b. Left column middle shelf: axial elements
   c. Left column bottom shelf: lower limb elements
   d. (ignore right column boxes)

3. Middle row of cabinets (casts of 7 individuals are located on surface of cabinet.
   Within lower row of cabinets (R-L):
   a. Exploded skull, infant articulated skeleton and child skull
   b. Skulls of adults
   c. Locked cabinet
   d. Casts and real bones with pathological conditions on right side. On cabinet
      surface: osteometric boards more toward middle.

B. Do’s and Don’ts

*DO* put away specimens you are using when you are done in the proper box and shelf
location, even if you didn’t get them out. There is another lab section that follows ours
and they need to set up their material as soon as our class time is over.

*DO* report and repair any damage to specimens. Of course handle the material with care,
but in the event something is broken, there’s glue around for you to repair or get me if the
you can’t fix it yourself.

*DO* work together and share. Some types of specimens are in limited supply. The best
way to study is to combine working independently with working in groups. You are
encouraged to form study groups now. Come during open lab hours (Thurs 3-4:30) or see
me during office hours where I have some bone casts located in my office or can unlock
the lab for you for a limited time – realize that time spent in lab is directly proportional to
your success in the class.

*DON’T* pick up a skull by the eye sockets like a bowling ball. Use the foramen magnum
instead and always use **two** hands to support.

*DON’T* snap teeth together (maxilla and jaw). They chip very easily.

*DON’T* mark the bones with pen or pencil.

*DON’T* take any bones out of the laboratory. I have made an inventory of the remains and
we have limited supplies so for common courtesy (your fellow students and future ones
need to study too!) study only in the lab.
C. Handling bones

**Storage**
Like other natural products, bone is best stored in a cool and dry place. Do not store wet bone. If bone gets wet for whatever reason, allow bone to air dry before putting it away. Storing wet bone in plastic creates a humid micro climate that promotes the growth of discoloring molds.

Ultraviolet radiation is destructive to the proteins that make up bone. Do not leave bone in direct sunlight for long periods of time, as they will become brittle and eventually fall apart.

**Cleaning**
Because bone is porous, it stains easily and absorbs oils from our skin. To prevent staining, bone should always be handled with clean hands. There is a sink, soap, and paper towels in front.

If your specimen picks up dirt, clean it with warm soapy water using a gentle bristle brush. A soft toothbrush works great. Only wet the surface of the bone, as soaking bone all the way through will hasten decomposition or cause the bone to crack upon drying. Don’t store it wet!

**Handling**
Handling bones safely is a matter of common sense. Don’t handle specimens more than you have to. Hold specimens over a table or other surface with foam padding.

Pick up skulls from beneath, watching out for loose mandibles. Never lift a skull by the eye sockets, zygomatic arches (cheekbones), or any other projection not meant to hold weight. Place skulls on the “donut” rings to stabilize and support easily chipped teeth.

Remember that while strong, bone is not indestructible. Treat your specimens with care and consideration.

STUDENTS WITH DISABILITIES: If you are a student with a disability and would like to discuss special academic accommodations, please speak to me as early as possible. Also please contact Disabled Students Resources and Services at 2210 Wilbur Ave (269) 387-2116.

**ACADEMIC INTEGRITY**
You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate Catalog that pertain to Academic Integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Academic Integrity. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with me if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.