

Anthropology 3510: Human Osteology
Mon / Wed 8:00 – 9:45 am, Moore Hall G0115

Instructor: **Dr. Jacqueline Eng**
Office: **Moore Hall 1045**
Office Hours : **M/W 1-2pm in office and Tu 2-4 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, biological affinities, 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)!

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

Required Texts*/Readings:

- 1) *The Human Bone Manual* (2005), by Tim D. White and Pieter A. Folkens. Academic Press.
- 2) *Standards for Data Collection from Human Skeletal Remains: Proceedings of a Seminar at the Field Museum of Natural History organized by Jonathan Haas*. Jane E. Buikstra and Douglas H. Ubelaker (eds.). Arkansas Archaeological Survey.
- 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.

*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	10% - 40 points
Sketches (4)	10% - 10 points each
Labs (4)	25% - 25 points each
Quizzes (4)	30% - 30 points each
Burial Report	25% - 100 points
Total points for course grade:	400 points

Attendance & Participation: Regular attendance is mandatory and will benefit your understanding of concepts and class performance. Be on-time, 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 (on a rotating basis) will be in charge of preparing at least 4 questions to generate discussion during these periods.

You can miss 2 classes, but after the second missed day, each subsequent missed class will result in the lowering of your final grade by ½ a grade. You must also 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.

Sketches: Use a folder to hold drawings of skeletal remains. Every two weeks, starting with the fourth week, submit your folder with drawings of two elements studied within the past few 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. This skill is useful for field purposes and also helps you remember elements and their features. By the end, you'll have 8 sketches to refer back to, each worth 5 points.

Labs: There will be four lab exercises, each worth 25 points. These labs will focus on practicing osteological methods and techniques presented in lecture. They are due at the end of the class meeting, with **NO** make up lab exercises.

Quizzes: Evaluations of your grasp of class concepts will be obtained through four short quizzes. There will be a total of 4 quizzes, each worth 30 points (7.5%). Quizzes are administered at the beginning of class and are timed. Each quiz will consist of bone identification (even fragmentary bone), identification of diagnostic features, and data recording where appropriate. There are **NO** make-up exams.

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 100 points (25%).

Burial reports are due by the Final Exam day, Thursday Dec. 11, 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 received Dec. 12. No papers will be accepted if later than 2 days (no papers after Dec 12) 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 of the Final. 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* 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/help/guides/style.php>).

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

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.

COURSE SCHEDULE

Wk	Date	Class Topic	Reading	Lab
1	3-Sep	Introduction: course topics, lab procedures; Anatomical terms	WF 1, 6; (e) Burns; Landau	
2	8-Sep	Bone Biology and Function	WF 4; BU p.3-5; (e) Bass; Ortner (optional)	Lab 1: Inventory skeleton with BU
	10-Sep	Bones of Skull I	WF 7	
3	15-Sep	Bones of Skull II		
	17-Sep	Sex and Age of the Skull	WF19 (p.359-364, 385-389); BU p.15-16;19-20;32-36	Lab 2: Age/sex skull
4	22-Sep	Quiz 1; Skull: Metrics, Biological affinities	WF 19 (p.400-411); BU p.69-78	Sketches 1 due
	24-Sep	Dentition: Morphology and Development; Sex & Age; Variation	WF 8; 19 (p.364-368); BU 5, 6	
5	29-Sep	Diet; Diseases affecting skull	WF 17, 19 (p.411-414); (e) Lewis	Discussion
	1-Oct	Vertebrae, Sternum, Ribs	WF 9-10	
6	6-Oct	Diseases affecting vertebrae & ribs	(e) Rogers; Lambert	Discussion; Sketches 2 due
	8-Oct	Quiz 2; Clavicle, Scapula	WF 11	
7	13-Oct	Humerus, Ulna, Radius	WF 12	
	15-Oct	Carpals, Metacarpals, Phalanges	WF 13	
8	20-Oct	Quiz 3; Bones of the Pelvis	WF 14	Sketches 3 due
	22-Oct	Pelvis: Sex and Age	WF 19 (p.374-85, 393-398); BU 3	Lab 3: Age/sex os coxae
9	27-Oct	Limb growth and malformations	(e) Ortner - rickets	Discussion
	29-Oct	Femur, Patella, Tibia, Fibula	WF 15	Burial analysis
10	3-Nov	Long bone metrics; Height	WF 19 (p.398-400); BU p.79-84	Lab 4: Metrics; Sketches 4 due
	5-Nov	Tarsals, Metatarsals, Phalanges	WF 16	
11	10-Nov	Diseases of the limbs and joints	(e) Lieveise; Larsen	Discussion
	12-Nov	Quiz 4; Burial report update	WF 18	Burial analysis
12	17-Nov	Field Procedures	WF 2; (e) Buzon; Powell	Burial analysis
	19-Nov	Ethics in Osteology	WF 3; (e) Walker; Rose	Discussion
13	24-Nov	Postmortem Modification	WF 5; BU 9	Burial analysis
	26-Nov	Film		Burial analysis
14	1-Dec	Paleopathology	BU 10; (e) Goodman	Discussion
	3-Dec	Bioarchaeology	(e) Woods; Wright	Discussion
15		FINALS: Report DUE Thur, Dec 11, by 10am in my office		

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.

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 (Tues 2-4) 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.