

IDS 2935 What Do Bones Tell Us?

Quest 2

I. Course Information

Spring 2021

Meeting Day/Time: MWF 9:35-10:25 AM (Period 3)

Location: LEI 0104

Primary General Education Designation: Biological Sciences

A minimum grade of C is required for general education credit

Instructor

Instructor – John Krigbaum, Ph.D.

Office location: 1350A Turlington Hall

Office hours: M 2:00-4:00 PM via zoom

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Course Description

What Do Bones Tell Us? focuses on the human skeleton and its transformation over time. The course will review basic terms and concepts in human anatomy, embryology, and physiology, and introduce students to fundamentals in evolutionary biology, vertebrate paleontology, biological anthropology, and bioarchaeology. As a general education biological science course ('B'), *What Do Bones Tell Us?* focuses on the biological and biocultural history of the human skeleton. Students will learn how diverse areas of science contribute to what we know about the human skeleton, and students will consider how we as a society benefit from that detailed knowledge. The course explores biocultural facets of modern human biology and behavior, and the myriad types of information gleaned from skeletal tissue to understand (and appreciate) the human condition, past and present. Course content and delivery will permit students to ask big questions such as who are we and where do we come from?

What Do Bones Tell Us? provides students the opportunity to develop an appreciation of the comparative method used routinely in the life sciences and to explore the role of homology in vertebrate evolution through an appreciation of their own human skeleton. Through active learning activities and group projects, students will develop critical skills in the analysis and interpretation of qualitative and quantitative data to understand animal diversity. It introduces fundamentals about vertebrate and human evolution and reinforces how scientific inquiry contributes substantively to increased knowledge about our world, and its maintenance. How does knowledge of vertebrate biodiversity contribute to what we know about our skeletons and ourselves? How does an evolutionary perspective of human evolution contribute to who we are today and how might society benefit from that knowledge?

What Do Bones Tell Us? weaves lecture and discussion in each 50-minute class session (MWF 50-minute preferred format). Lectures on Mondays and Wednesdays focus on key content and concepts. Friday

class meetings led by the Instructor focus on group activities and discussion of assigned readings/videos (which should be read/viewed prior to class).

What Do Bones Tell Us? provides students basics in the biological sciences to contemplate their bodies and their place in nature. Students will be encouraged to have the autonomy to reflect on the spatial and temporal scales of the human skeleton and to appreciate its form and function. Through individual and group activities and discussion, the course provides students the opportunity for individual and group reflection and constructive thinking about how interdisciplinary inquiry works, and how to apply creatively new lines of inquiry to their own areas of interest at the University of Florida (and beyond).

Required & Recommended Course Materials (to purchase/rent)

Required:

Switek, Brian (2019) *Skeleton Keys: The Secret Life of Bone*. New York: Riverhead Books. (276 pp.)

Blogs: [Written In Stone: interview with Brian Switek](#) | A Blog Around The Clock
John Hawkes weblog: johnhawkes.net
<https://blogs.scientificamerican.com/>
<https://carlzimmer.com/category/blog/>

Recommended:

Bahn, Paul (2003) *Written in Bones: How Human Remains Unlock the Secrets of the Dead*. Buffalo, NY: Firefly Books. (192 pp.)

Hall, Brian K. (2007) *Fins into Limbs: Evolution, Development, and Transformation*. Chicago: University of Chicago Press. (433 pp.)(* UF has unlimited access to this advanced edited volume via eBooks *)

Shubin, Neil (2009) *Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body*. New York: Vintage. (256 pp.)

Materials and Supplies Fees: N/A

II. Coursework & Schedule

1. List of Graded Work

Assignment	Description	Requirements	Points
In Class Group Activity	Students will work in teams of 2-3 and review primary literature on a spectacular find, and present to class (most Fridays, N=10 will be graded)	In class participation	100
Homework	Students will be assigned 10 homework exercises based on discoveries of remarkable skeletal remains and the primary literature and data associated with their publication and analysis (cf. 'supplementary materials' include comprehensive data in various formats). These materials tend to be 'all access' and are readily available to UF students.	Written work submitted	200
Exam 1	In class exam based on material covered in the first half of class.	Written exam	250
Exam 2	In class exam based on material covered in the second half of class.	Written exam	250
Final Paper	<p>Final analytical essay (~6-8 double-spaced pages, not including references) focused on subject of interest to student that requires the comparison and self-reflection of the human skeleton and its form, function, and adaptation to life as a student in college.</p> <p>As the course progresses, students will be 'coached' on their paper topic and encouraged to find a comparative taxon to use as a reference to their own human skeleton. Each week, as we approach spectacular finds in the natural history of the vertebrates, we will highlight how the findings that week compare with our own skeletons and their structure/function. Through the use of concrete examples, students will be reinforced on the comparative approach 'in action'.</p> <p>By Week 10 (after Spring Break), students will be required to upload a one page topic and broad outline of their comparative paper and list key references. Students will receive feedback so that they can move forward in drafting their final paper due Week 15 (April 21, 2021).</p>	Written work	200

2. Spring 2021 Weekly Course Schedule

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
I. Natural History of the Primate Skeleton			
Week 1 - 1/11-1/15	Topic	Introduction	
	Summary	Introduction to the study of bone. First week overview of course will highlight myriad fields of inquiry that rely on analysis of bone/bone tissue. Central themes introduced include bone histology, bone chemistry, and growth and development.	
	Readings/Works	Brown, Peter (no date) The Human Skeleton. A useful, albeit detailed, resource for this course: http://www.peterbrown-palaeoanthropology.net/skeleton.pdf Switek (2019:1-32)	
	Assignment	Review online resources available for this course, including introductory video for http://www.becominghuman.org/node/interactive-documentary .	N/A
Week 2 - 1/20-1/22	Topic	Evolution	
*No class 1/18 (MLK Jr.)	Summary	Basic principles of evolutionary biology are introduced, specifically focused on the analysis of the vertebrate skeleton, and the definition of species and geological context. Key concepts introduced include homology, ontogeny, allometry, and life history.	
	Readings/Works	Wood (2005:1-23) Switek (2019:35-62) Zimmer, Carl (2008) What is a species. <i>Scientific American</i> (June) 298(6):72-79. Additional Reading Carroll, Sean B., Prud'homme, Benjamin, and Gompel, Nicholas (2008) Regulating evolution. <i>Scientific American</i> (May) 298(5):60-67.	
	Assignment	The human skeleton worksheet: http://www.oum.ox.ac.uk/educate/resource/human2.pdf	Upload Homework

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		<p><i>Field Trip 1. Museum Visit 1.</i> On your own (and if you are able) visit the Florida Museum of Natural History permanent exhibit: Florida Fossils: Evolution of Life and Land. Become familiar with the fossil hall and its displays, as you will have the opportunity in this class to revisit and build on this exhibit focused on key taxa of your choice.</p> <p>Homework #1. Virtually, visit the website homepage of http://www.eskeletons.org/. Compare your skeleton with other primate species. Identify 1 (or two) key bones in the following regions of your skeleton (skull, shoulder, arm, hand, forearm, spine, pelvis, thigh, leg, foot). Group exercise (on your own time) www.eskeletons.org life size printout (exercise).</p>	#1 on Wednesday, Jan. 20 th
Week 3 - 1/25-1/29	Topic	Tetrapoda	
	Summary	Review of amphibians, reptiles, and mammals and the skeletal evidence for the transition to land. Highlight key structural changes in the skull (jaws, teeth, and ears) and the development of four limbs.	
	Readings/Works	<p>Switek (2019:65-88)</p> <p>Clack, Jennifer A. (2005) Getting a leg up on land. <i>Scientific American</i> (December) 293(6):100-107.</p> <p>Dalton, Rex (2006) The fish that crawled out of the water. <i>Nature</i> doi:10.1038/news060403-7.</p> <p>Daeschler, Edward B., Shubin, Neil H., and Jenkins Jr., Farish A. (2006) A Devonian tetrapod-like fish and the evolution of the tetrapod body plan. <i>Nature</i> 440:757-763. https://doi.org/10.1038/nature04639</p> <p>Resources:</p> <p>Nair, Prashant (2014) QnAs with Neil Shubin. <i>PNAS</i> 111(3):881-882. https://doi.org/10.1073/pnas.1321499110</p>	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		Website: https://tiktaalik.uchicago.edu/ Additional Reading Shubin, Neil H., Doeschler, Edward B., and Jenkins Jr., Farish A. (2014) Pelvic girdle and fin of <i>Tiktaalik roseae</i> . <i>PNAS</i> 111(3):893-899. Stewart, Thomas A. et al. (2020) Fin ray patterns at the fin-to-limb transition. <i>PNAS</i> 117(3):1612-1620. https://doi.org/10.1073/pnas.1915983117 Schweitzer, Mary H. (2010) Blood from stone. <i>Scientific American</i> (December) 303(6):62-69.	
	Assignment	Group Activity: How do basic mammalian teeth work? (Jim Mellet's tribosphenic tooth cut-outs) Faculty Spotlight: Dr. Michael Granatosky (UF Alum –BA Anthropology, 2011) https://www.nyit.edu/bio/michael.granatosky	N/A
Week 4 - 2/1-2/5	Topic	Mammalia	
	Summary	Review of the modern mammals and their radiation. We will highlight key differences in mammal-like reptiles the mammal skeleton compared to birds/reptiles. Discussion of as well as origin and early diversification of placental mammals.	
	Readings/Works	Brusatte, Stephen and Luo, Zhe-Xi (2016) A Scent of the Mammals. <i>Scientific American</i> (June) 314(6):28-35. Pennisi, Elizabeth (2019) How life blossomed after the dinosaurs died. <i>Science</i> 366:409. DOI: 10.1126/science.366.6464.409. Lyson, T.R. et al. (2019) Exceptional continental record of biotic recovery after the Cretaceous-Paleogene mass extinction. <i>Science</i> 366:977-983. DOI: 10.1126/science.aay2268	
		Video (Before Friday's class): NOVA: Rise of the Mammals: https://www.pbs.org/wgbh/nova/video/rise-of-the-mammals/ Extreme Mammals website: https://www.amnh.org/exhibitions/extreme-mammals/what-is-a-mammal	Upload Homework #2 on

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
	Assignment	<p>Faculty Spotlight: Stephen Chester (UF Alum – BS Marketing, BA Anthropology, 2005) http://www.brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/anthropology/faculty/faculty_details.php?faculty=1170 ; http://stephenchesterpaleontology.com/index.php/stephen-chester-bio/</p> <p>Group Activity, Part 1. Using Extreme Mammals website, review ‘extreme bodies’ section and discuss different animal ‘gear’ and compare your own bodies to these extreme examples. Part 2. Use Animal Diversity website (https://animaldiversity.org/) and Tree of Life website (http://tolweb.org/tree/) conduct research on what is known about mammals before and after the K-Pg boundary ... each group will provide lightning presentation in class on a pre-assigned Order of mammals.</p>	Monday, Feb. 1 st
Week 5 – 2/8 – 2/12	Topic	Primates	
	Summary	Introduction to the primates and their skeleton, focusing on monkeys and apes. Review key differences between primates and non-primate mammals. Discuss changes in teeth and changes in tooth morphology.	
	Readings/Works	<p>Switek (2019:91-110)</p> <p>Walton, Rebecca (2009) Introducing <i>Darwinius masillae</i>. EveryONE PLoS One Blog. https://blogs.plos.org/everyone/2009/05/19/plos-one-introduces-darwinius-masillae/</p> <p>Franzen, Jens L. et al. (2009) Complete primate skeleton from the Middle Eocene of Messel in Germany: Morphology and Paleobiology. <i>PLOS ONE</i> 4(5): e5723. doi: 10.1371/journal.pone.0005723</p> <p>Additional Reading</p>	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		<p>Seiffert, Erik R. et al. (2009) Convergent evolution of anthropoid-like adaptations in Eocene adapiform primates. <i>Nature</i> 461:1118-1121. https://doi.org/10.1038/nature08429</p> <p>Franzen, Jens L. et al. (2009) Correction: Complete Primate Skeleton from the Middle Eocene of Messel in Germany: Morphology and Paleobiology. <i>PLOS ONE</i> 4(7): 10.1371/annotation/137a79c7-5807-47fc-b885-1f5cc2493305. https://doi.org/10.1371/annotation/137a79c7-5807-47fc-b885-1f5cc2493305</p> <p>Franzen, Jens L. et al. (2009) Correction: Complete Primate Skeleton from the Middle Eocene of Messel in Germany: Morphology and Paleobiology. <i>PLOS ONE</i> 4(7): 10.1371/annotation/18555b51-1fd1-47b6-a362-aaaa24a53da. https://doi.org/10.1371/annotation/18555b51-1fd1-47b6-a362-aaaa24a53da</p> <p>Resources: Extreme Mammals: <i>Darwinius masillae</i>. (AMNH) https://www.amnh.org/exhibitions/extreme-mammals/meet-your-relatives/darwinius-masillae (Extreme Mammals website: https://www.amnh.org/exhibitions/extreme-mammals)</p> <p>Spotlight: Doug Boyer (Duke University): http://www.dougboyer.com/</p>	
	Assignment	<p><i>Field Trip 2. Museum Visit 2. Formal tour of the Florida Museum of Natural History permanent exhibit by a Curator of Vertebrate Paleontology: Florida Fossils: Evolution of Life and Land.</i></p> <p>What is ‘extreme’ about <i>Darwinius masillae</i>? What are the details of this discovery in terms of teamwork involved to produce the report? What about the ‘spin’ involved in spreading the news.</p>	Upload Homework #3 on Monday, Feb. 8 th
II. Natural History of the Human Skeleton			
Week 6 – 2/15-2/19	Topic	Bipedalism	
	Summary	Key aspects of the hominoid (ape) skeleton are reviewed and the fossil evidence of early the first upright walkers is introduced. Skeletal highlights focus on the analysis	

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		of weight-bearing joints and limbs and determining how an animal moves on two legs as opposed to walks on all fours.	
	Readings/Works	<p>Wood (2005:24-83) Switek (2019:113-131) Harmon, Katherine (2013) Shattered ancestry. <i>Scientific American</i> (February) 308(2):42-49. Shreeve, Jamie. 2010. The Evolutionary Road. <i>National Geographic</i> July 2010 pp. 34-67.</p> <p>Additional Reading White, Tim D. et al. (2015) Neither chimpanzee nor human, <i>Ardipithecus</i> reveals the surprising ancestry of both. <i>PNAS</i> 112(16):4877-4884. doi.org/10.1073/pnas.1403659111</p> <p>Resources: Hogenboom, Melissa (2014) The ‘Lucy’ fossil rewrote the story of humanity. BBC Earth link: http://www.bbc.com/earth/story/20141127-lucy-fossil-revealed-our-origins PODCAST: (BBC Inside Science podcast – fast forward to 19:45)</p>	
	Assignment	Identify the key bipedal traits in your own skeleton, and produce a ‘lab report’ that indicates key features of upright walking and the transformation of the skeleton from a quadruped to a biped. Students will evaluate hypotheses and data provided that contribute to our knowledge of diversity of bipedal locomotion and what evidence is brought to bear to support these changing perspectives.	Upload Homework #4 on Monday, Feb. 15 th
Week 7 - 2/22-2/26	Topic	Jaws & Teeth	
	Summary	Aspects of the jaws and teeth are introduced with respect to identifying different species in the fossil record. Skeletal highlights focus on analysis of functional morphology and biomechanics using living (extant) and extinct forms to interpret differences in the identification species, and diet.	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
	Readings/Works	<p>Switek (2019:133-151)</p> <p>Wood (2005:71-83)</p> <p>Wong, Kate (2016) Mystery Human. <i>Scientific American</i> (March) 314(3):28-37.</p> <p>Early <i>Homo</i> (read articles in order listed, ca. 8 pp.).</p> <p>Sugden, Andrew M. (2015) Finding <i>Homo</i> nearly 3 million years ago. <i>Science</i> 347:1325. DOI: 10.1126/science.347.6228.1325-g</p> <p>Gibbons, Ann (2015) Deep roots for the genus <i>Homo</i>. <i>Science</i> 347:1056-1057. DOI: 10.1126/science.347.6226.1056-b</p> <p>Villmoare, Brian et al. (2015) Early <i>Homo</i> at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia. <i>Science</i> 347:1352-1355. DOI: 10.1126/science.aaa1343</p> <p>Additional Reading</p> <p>Dimaggio, Erin N. et al. (2015) Late Pliocene fossiliferous sedimentary record and the environmental context of early <i>Homo</i> from Afar, Ethiopia. <i>Science</i> 347:1355-1359. DOI: 10.1126/science.aaa1415</p> <p>Hawks, John, de Ruiter, Darryl J., and Berger, Lee R. (2015) Comment on “Early <i>Homo</i> at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia” <i>Science</i> 348:1326. DOI: 10.1126/science.aab0591</p> <p>Villmoare et al. (2015) Response to Comment on “Early <i>Homo</i> at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia”. <i>Science</i> 348:1326. DOI: 10.1126/science.aab1122</p>	
	Assignment	<p>Under the ‘Species’ category, explore skeletal evidence at humanorgins.si.edu for <i>Homo habilis</i> and <i>Homo rudolfensis</i>. Types of questions will include: What are some of the iconic fossils for these two groups, and how do they differ from one another. Instructor will provide metric data on cheek tooth size and isotopic data from tooth enamel for students to analyze in MS Excel to contextualize differences between the two taxa. Students will formulate hypotheses and test the outcomes given different parameters of the data.</p>	Upload Homework #5 on Monday, Feb. 22 nd

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
Week 8 - 3/1-3/5	Topic	Brains & Guts	
	Summary	Early human changes in stature and limb proportion are explored with respect to evidence in the fossil record for encephalization (brain size increase) and changes towards 'habitual' walking and running (on two legs). Skeletal highlights focus on the 'expensive tissue hypothesis'.	
	Readings/Works	Wood (2005:84-99) Aiello, Leslie C. and Wheeler, Peter (1995) The expensive-tissue hypothesis. <i>Current Anthropology</i> 36(2):199-221. doi:10.1086/204350. Brown, Frank et al. (1985) Early <i>Homo erectus</i> skeleton from west Lake Turkana, Kenya. <i>Nature</i> 316:788-792. Caspari, Rachel (2011) The evolution of grandparents. <i>Scientific American</i> (August) 305(2):44-49. Resources: https://www.britannica.com/place/Nariokotome http://humanorigins.si.edu/evidence/human-fossils/fossils/knm-wt-15000	
	Assignment	N/A	Upload Final Paper Topic and Outline, Wednesday, Mar. 3 rd
Week 9 – 3/8-3/12	Topic	Diet & Climate	
	Summary	Early humans adapted to diverse diets and there are novel approaches to interpreting what they ate using tools of bone chemistry. Skeletal highlights focus on differences	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		in tooth (molar) microwear and how we interpret diets (and climates) in the distant past.	
	Readings/Works	Switek (2019:153-173 Wood (2005:100-115) Leonard, William R. (2002) Food for thought. <i>Scientific American</i> (December) 287(6):106-115.	
	Assignment	N/A	
Week 10- 3/15-3/19	Topic	On the move	
	Summary	Modern humans ventured across the Old World and left their mark in a variety of ways, including in the genes of present-day people and the fossilized remains of modern (and extinct) humans. Skeletal highlights focus on ancient DNA and the preservation of bone.	
	Readings/Works	Switek (2019:175-196) Marean, Curtis W. (2015) The Most Invasive Species of All. <i>Scientific American</i> (August) 313(2):32-39. Hammer, Michael F. (2013) Human hybrids. <i>Scientific American</i> (May) 308(5):66-71. Hofman, Courtney A. and Warinner, Christina (2019) Ancient DNA 101. <i>The Archaeological Record</i> 19(1):18-25. Wong, Kate (2009) Rethinking the Hobbits of Indonesia. <i>Scientific American</i> (November) 301(5):66-73. Neanderthals Additional Reading Price, Michael (2020) Africans, too, carry Neanderthal genetic legacy. <i>Science</i> 367:497. DOI: 10.1126/science.367.6477.497 Stewart, J.R. and Stringer, C.B. (2012) Human Evolution Out of Africa: The Role of Refugia and Climate Change. <i>Science</i> 335:1317-1321.	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		http://humanorigins.si.edu/evidence/human-fossils/shanidar-3-neanderthal-skeleton	
	Assignment	Review the different types of genetic data used by archaeologists to learn about past lifeways. Compare the nature of these different datasets and how they confirm what we know and raise questions that we don't yet know (or have the tools just yet to address the question(s)).	Upload Homework #6 on Monday, Mar. 15 th
III. Biocultural History of Humankind			
Week 11- 3/22-3/26	Topic	The Biological Profile	
	Summary	Modern humans are a diverse lot and their skeletons too are diverse. In this week, we explore the basic concepts of aging and sexing the human skeleton and interpreting how their stature (how tall they were) and their ancestry, when possible. Skeletal highlights focus on clinal effects (related to latitudinal differences) on size and shape of the human skeleton and limb proportions.	
	Readings/Works		
	Assignment	What does it mean to be a <i>modern</i> human? Students will critically explore the history of scientific racism and past attempts to partition by biological/sociocultural 'race'. Faculty Spotlight: Dr. Cris Erin Hughes (UF Alum – BA Anthropology, 2004). Assistant Clinical Professor, Anthropology, University of Illinois, Urbana-Champaign. https://anthro.illinois.edu/directory/profile/hughesc	Upload Homework #7 on Monday, Mar. 22 nd
Week 12- 3/29-4/2	Topic	Human Diversity	
	Summary	Diversity of humankind is explored through both skeletal remains and preserved DNA in ancient skeletal material. Skeletal highlights focus on human diversity and adaptations observed in the bioarchaeological record.	
	Readings/Works	Switek (2019:199-223)	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
		Bamshad, Michael J. and Olson, Steve E. (2003) Does race exist? <i>Scientific American</i> (December) 289(6):78-85. Jablonski, Nina G. (2010) The naked truth. <i>Scientific American</i> (February) 302(2):42-49. Pringle, Heather (2011) The First Americans. <i>Scientific American</i> (November) 305(5):36-41.	
	Assignment	‘One Species Living Worldwide’ http://humanorigins.si.edu/evidence/genetics/one-species-living-worldwide	Upload Homework #8 on Monday, Mar. 29 th
Week 13- 4/5-4/9	Topic	Health & Well-Being	
	Summary	In bioarchaeology, one fascinating field that is informed by biomedicine is that of paleopathology. We will review skeletal evidence associated with the archaeological record that highlights patterns of human adaptation in diverse contexts. Skeletal highlights focus on indirect evidence of health from the oral microbiome in (and on) your teeth (in the form of mineralized plaque).	
	Readings/Works	Ackerman, Jennifer (2012) The ultimate social network. <i>Scientific American</i> (June) 306(6):36-43. Additional Reading Larsen, Clark Spencer (2018) The Bioarchaeology of Health Crisis: Infectious Disease in the Past. <i>Annual Review of Anthropology</i> 47:295-313. https://doi.org/10.1146/annurev-anthro-102116-041441	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
	Assignment	Microbiome assignment. Although technically not our skeleton, we can learn a lot from the microbiome of preserved tissues recovered from archaeological (and fossil) human remains, particularly dental calculus. Identify one peer-reviewed article and present a one-page annotated bibliography of this work, and situate the findings of the research with what we have covered in this class to date. What hypotheses are addressed in the work and how do the authors utilize microbiome data to address their hypothesis?	Upload Homework #9 on Monday, Apr. 5 th
Week 14- 4/12-4/16	Topic	Mortuary Behavior	
	Summary	The disposal of the dead is a ghastly enterprise. Here we explore diverse approaches to how people celebrate the lives of their once-living members through the thoughtful act of burial. Skeletal highlights focus on traumatic injuries and how we interpret 'cause of death' in the prehistoric record.	
	Readings/Works	<p>Switek (2019: 225-243) read articles in order listed (ca. 20 pp.): Armelagos, George J. (2013) Reading the bones. <i>Science</i> 342:1291. DOI: 10.1126/science.1249076 Gibbons, Ann (2013) The Thousand-Year Graveyard. <i>Science</i>. <i>Science</i> 342:1306-1310. DOI: 10.1126/science.342.6164.1306 required multimedia: https://spark.sciencemag.org/the-thousand-year-graveyard/ Beets, Robert (2014) Science's 'The Thousand-Year Graveyard' Earns Archaeology Writing Award. https://www.aaas.org/news/sciences-thousand-year-graveyard-earns-archaeology-writing-award</p> <p>Faculty Spotlight: (UF Alum BS Zoology and BA Anthropology, 2005) Dr. Heather Garvin, PhD, D-ABFA (Des Moines University). https://www.dmu.edu/directory/heather-garvin-elling/ Also, check out: HD Forensics. https://www.hdforensics.com/hdforensic</p>	

Week/ Date	Activity	Topic/Assignment (Question/Subject)	Assigned Work Due
	Assignment	‘Fossil Forensics’ http://humanorigins.si.edu/research/fossil-forensics-interactive Track down using internet resources a study of a known individual and the analysis of their post-mortem remains. This week, for example, we have looked at Richard III’s remains. One page with references and one ‘sourced’ image.	Upload Homework #10 on Monday, Apr. 12 th
Week 15- 4/19-4/21	Topic	Identity	
	Summary	Social bioarchaeology connects important cultural components of what we know (or think we know) about purposeful burials in archaeological context. Skeletal highlights include the review of case studies of celebrated burials that highlight key differences and similarities of people across space and time.	
	Readings/Works	<i>Pronounced ‘chat-al-hue-uck’</i> Hodder, Ian (2004) Women and Men at Çatalhöyük. <i>Scientific American</i> (January) 290(1):76-83. Milner, George R. (2019) Early agriculture’s toll on human health. PNAS 116:13721-13723. https://doi.org/10.1073/pnas.1908960116 Larsen, Clark Spencer et al. (2019) Bioarchaeology of Neolithic Çatalhöyük reveals fundamental transitions in health, mobility, and lifestyle in early farmers. PNAS 116:12615-12623. https://doi.org/10.1073/pnas.1904345116 Bioarchaeology Spotlight: Clark Spencer Larsen (The Ohio State University): website: https://anthropology.osu.edu/research/laboratories/brl	
	Assignment	<i>In the last week of class, each student will share with their classmates a ‘lightning presentation’ with three Powerpoint slides in three minutes, highlighting their research findings and self-reflection of their own vertebrate skeleton.</i>	Upload Final Paper Wednesday, Apr. 21 st
	Final		

III. Grading

3. Statement on Attendance and Participation

Attendance and Participation:

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

- **Attendance:** will be taken daily and recorded in the Canvas gradebook. You are allowed four “personal days” for the semester, after which each absence that does not meet university criteria for “excused” will result in a two-point deduction from your final grade.
- **Participation:** Consistent informed, thoughtful, and considerate class participation is expected and will be evaluated using the rubric below for each of the Group Activities planned for Fridays. The instructor will inform you of your participation grade to date when mid-term exams are returned and schedule a conference if you are earning below 70% of the possible points.
- **NOTE:** If you have personal issues that prohibit you from joining freely in class discussion, e.g., shyness, language barriers, etc., see the instructor as soon as possible to discuss alternative modes of participation.

Participation Grading Rubric (N=10 Fridays during the semester—100 points total. 0 points per student, per missed class group activity):

	High Quality	Average	Needs Improvement
Informed: Shows evidence of having done the assigned work with constructive input.	4 points. Student fully informed and prepared for class group activity.	2-3 points. Student moderately prepared for class group activity.	1-2 point(s). Student unprepared or minimally prepared for class activity.
Thoughtful: Shows evidence of having understood and considered issues raised.	3 points. Student considers myriad aspects of class group activity.	2 points. Student considers only nominal aspects of class group activity.	1 point. Student not engaged in subject being discussed for class group activity
Considerate: Takes the perspective of others into account.	3 points. Student works well within assigned class group.	2 points. Student less considerate of others in assigned class group.	1 point. Student not considerate of others in assigned class group.

3a. Final Paper Grading Rubric

	SATISFACTORY (Y)	UNSATISFACTORY (N)
Content	Assignments exhibit evidence of ideas that respond to the topic with complexity, critically evaluating and synthesizing sources, and provide an adequate discussion with basic understanding of credible sources.	Assignments either include a central idea(s) that is unclear or off- topic or provide only minimal or inadequate discussion of ideas. Papers may also lack sufficient or appropriate sources.
Organization & Coherence	Assignments exhibit an identifiable structure for topics, including a clear thesis statement, and follow a logical progression of ideas.	Documents and paragraphs lack clearly identifiable organization, may lack any coherent sense of logic in associating and organizing ideas, and may also lack transitions and coherence to guide the reader.
Argument & Support	Assignments use persuasive and confident presentation of ideas, strongly supported with evidence.	Documents make only weak generalizations, providing little or no support, as in summaries or narratives that fail to provide critical analysis.
Style	Assignments use a writing style with word choice appropriate to the context, genre, and discipline. Sentences should display complexity and logical sentence structure.	Documents rely on word usage that is inappropriate for the context, genre, or discipline. Sentences may be overly long or short with awkward construction. Documents may also use words incorrectly.
Mechanics	<p>Assignments will feature correct or error-free presentation of ideas. At the weak end of the Satisfactory range, papers may contain a few spelling, punctuation, or grammatical errors that remain unobtrusive so they do not muddy the paper’s argument or points, but note for the purposes of your grade that I expect you to write professionally and I take points off for basic errors like these.</p> <p>I will evaluate and provide feedback on all written assignments with respect to grammar, punctuation, clarity, coherence, and organization.</p>	Papers contain so many mechanical or grammatical errors that they impede the reader’s understanding or severely undermine the writer’s credibility.

4. Grading Scale

For information on how UF assigns grade points, visit: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

A	94 – 100% of possible points		C	74 – 76%
A-	90 – 93%		C-	70 – 73%
B+	87 – 89%		D+	67 – 69%
B	84 – 86%		D	64 – 66%
B-	80 – 83%		D-	60 – 63%
C+	77 – 79%		E	<60

IV. Quest Learning Experiences

View details about the [Learning Experiences section in the UF Quest Syllabus Builder](#)

5. Details of Experiential Learning Component

Although not required for Quest 2, this course integrates the Florida Museum of Natural History permanent exhibit: [Florida Fossils: Evolution of Life and Land](#) into a broader understanding of the comparative method and its use in the natural anatomical sciences. Students are encouraged to visit the museum at least three times during the semester, and there will be one scheduled (and recorded) tour of the Hall (after all students have familiarized themselves with the exhibit) by an FLMNH Curator of Vertebrate Paleontology .

6. Details of Self-Reflection Component

This course requires students to explore their internal skeletons and compare their skeletons with a variety of different living and extinct taxa. Each week, group-led discussions on a renowned discovery help to reinforce student's place in nature, as will their submitted assignments. A final essay paper forces students to self-reflect and consider the comparative structure and function of their vertebrate skeleton at this important developmental stage in their life course.

V. General Education and Quest Objectives & SLOs

7. This Course's Objectives—Gen Ed Primary Area and Quest

Biological Sciences + Quest 2 + Course Objectives

Biological Sciences Objectives →	Quest 2 Objectives →	This Course's Objectives → (This course will....)	Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by...)
Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences.	Address in relevant ways the history, key themes, principles, terminologies, theories, or methodologies of the various social or biophysical science disciplines that enable us to address pressing questions and challenges about human society and/or the state of our planet.	This course will explore the vertebrate skeleton, both qualitatively and quantitatively, with an emphasis on how the scientific method is applied to understand the morphology and diversity of animals and humans in the past (and present)	This will be accomplished through the analysis of exemplary discoveries of preserved skeletal remains and individual/group analysis of associated qualitative and quantitative data from the literature.
		This course will explain how the comparative approach and the use of homology is used in the life sciences to explain form and function of the human skeleton.	This will be accomplished through course lectures and shared content that includes online resources and repeated visits and a guided tour of the Florida Museum of Natural History (Florida Fossils exhibit).
Courses focus on major scientific developments and their impacts on society,	Present different social and/or biophysical science methods and theories and consider how	This course will review and assess diverse and novel scientific approaches used in the analysis of	This will be accomplished through lecture, readings, and online content (and visits to

Biological Sciences Objectives →	Quest 2 Objectives →	This Course's Objectives → (This course will....)	Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by...)
science and the environment, and the relevant processes that govern biological systems.	their biases and influences shape pressing questions about the human condition and/or the state of our planet.	fossil skeletal remains and how such methods contribute to the analysis of the human skeleton.	the FLMNH) and problem sets that present data for students to calculate biological metric and nonmetric traits.
Students will formulate empirically-testable hypotheses derived from the study of living things, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.	Enable students to analyze and evaluate (in writing and other forms of communication appropriate to the social and/or biophysical sciences) qualitative or quantitative data relevant to pressing questions concerning human society and/or the state of our planet.	This course will teach students how to apply fundamental principles of evolutionary biology and skeletal mechanics, and formulate testable hypotheses using data to address how changes in the vertebrate skeleton has affected how we interpret the human skeleton.	This will be accomplished in lectures (Mondays and Wednesdays) and group discussion and activities (Fridays), and in self-reflection exercises (weekly reports) and in their final paper.
Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences.	Analyze critically the role social and/or the biophysical sciences play in the lives of individuals and societies and the role they might play in students' undergraduate degree programs.	This course will teach how the scientific method used is applied routinely in comparative anatomy and developmental biology, using the human skeleton as its template.	This will be accomplished through individual and group activities (and reflection), a weekly journal, and a final paper project.
	Explore or directly reference social and/or biophysical science resources outside the classroom and explain how engagement with those	This course will provide students the opportunity to integrate with guest lecturers from the Florida Museum of Natural History and allow students the opportunity to	This will be accomplished through guest lectures and student engagement in class (and at the Florida Museum of

Biological Sciences Objectives →	Quest 2 Objectives →	This Course's Objectives → (This course will...)	Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by...)
	resources complements classroom work.	reflect on and access/analyze data that is novel (but topical) to this course.	Natural History), and in their final paper project

8. This Course's Student Learning Outcomes (SLOs)—Gen Ed Primary Area and Quest

Biological Sciences + Quest 2 + Course SLOs

	Biological Sciences SLOs → Students will be able to...	Quest 2 SLOs → Students will be able to...	This Course's SLOs → Students will be able to...	Assessment Student competencies will be assessed through...
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.	Identify, describe, and explain the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course.	Identify, describe, and explain biological aspects of the human skeleton that reflect their vertebrate, mammalian, and primate heritage, and modern human biocultural adaptations.	Homework assignments, exams, lightning presentation, and a final paper.

	Biological Sciences SLOs → Students will be able to...	Quest 2 SLOs → Students will be able to...	This Course's SLOs → Students will be able to...	Assessment Student competencies will be assessed through...
			Identify, describe, and explain the role of homology in comparative anatomy and how it aids in an understanding of the human skeletal system, and how evolutionary and cultural factors have helped shape the skeleton.	Homework assignments, exams, lightning presentation, and a final paper.
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes.	Critically analyze quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge.	Critically analyze and evaluate qualitative and quantitative data derived from fossil (and modern) skeletal material to draw conclusions and test hypotheses about the history of life and the human condition.	Homework assignments, exams, lightning presentation, and a final paper.
			Critically evaluate and assess the contribution of the analysis of the human skeleton and its biology and development, with respect to what is known (not known, and unknowable) in the history of life.	Homework assignments, exams, lightning presentation, and a final paper.

	Biological Sciences SLOs → Students will be able to...	Quest 2 SLOs → Students will be able to...	This Course's SLOs → Students will be able to...	Assessment Student competencies will be assessed through...
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Develop and present , in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges.	Develop and present in writing the analysis of qualitative and quantitative data, and logic to draw reasonable conclusions based on their analysis on a specific problem.	Homework assignments, lightning presentation, and final paper.
Connection	N/A	Connect course content with critical reflection on their intellectual, personal, and professional development at UF and beyond.	Analyze and compare their human skeleton to address key changes in the vertebrate skeleton and accommodations that may occur due to biocultural adaptations (and insults).	Lightning presentation, and final paper.

9. Secondary Objectives and SLOs (Optional)

N/A

VI. Required Policies

View details about the required policies in the [UF Quest Syllabus Builder](#).

10. Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

11. UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

12. University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

13. Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

14. The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at <http://writing.ufl.edu/writing-studio/> or in 2215 Turlington Hall for one-on-one consultations and workshops.