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Fall 2023 Vertebrate Paleontology (GEOL-334-001, GEOL-534-001, BIOL-334-001) Syllabus

Syllabus

Build Content Assessments Tools Partner Content

Instructor Information

Enabled: Statistics Tracking

Instructor Contact Information:

Dr. Mark D. Uhen

Office location, 277A Research Hall

Office Hours, 1:15 to 2:00 pm Wednesdays or by appointment.

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Class Location and Time : EXPL 1309, Monday & Wednesday, 12:00-1:15 pm

Vertebrate Palaeontology

Enabled: Statistics Tracking

Title	**Vertebrate Palaeontology**
Author	Michael J. Benton
ISBN	978-1-118-40684-7
Publisher	John Wiley&Sons, Incorporated
Publication Date	October 20, 2014
Binding	Trade Paper
Type	Print
Price	$99.95
Required	

Vertebrate Paleontology, GEOL/BIOL 334 Lecture

Enabled: Statistics Tracking

Vertebrate Paleontology, GEOL/BIOL 334 Lecture

STUDENT RESPONSIBILITIES

Students are expected to have read the syllabus and be familiar with expectations, due dates for assignments, and dates and times for quizzes and exams. The syllabus will be posted on the Blackboard system and students are expected to pay attention to any changes that are made over the course of the semester.

Classroom health and safety: All students are required to know and follow all Mason health and safety guidelines.

Group study and note taking: Students in the class will be divided into several groups. Each day of lecture, one group will be responsible for posting notes from lecture to the class Lecture Notes wiki before the next class period. All members of each group will be expected to contribute to each posting. Students are also encouraged to use their group to study for quizzes and exams. Additional assignments may also involve group activity.

Use of Electronics: Students are not allowed to record lectures or to use cameras or phones to take photos of lecture slides. Students are also not allowed to take notes using a computer or other device during lectures. Studies have shown that taking notes with a pen and paper yields significantly more retention of material vs. taking notes on a computer, so this policy is designed to help students learn. Exceptions may be made for students with

accommodations from the Office of Disability Services (see below). Students are expected to keep devices on silent and put away during lecture.

Communication: Students are expected to check their Mason email and the Blackboard system daily for information about the course. Students are expected to have read the syllabus and be familiar with expectations, due dates for assignments, and dates and times for quizzes and exams. The syllabus, including the schedule is posted on Blackboard and students are expected to pay attention to any changes that are made over the course of the semester. Failure to be aware of information posted to a student's Mason email account or on Blackboard is not a valid excuse for missing assignments, assignment instructions, tests, presentations or student responsibilities of any kind.

This course operates under the rules of the George Mason University Honor System and Code. Please be familiar with the code. Quizzes and exams are closed book and your answers must be your own.

Students are expected to respectful of the instructor and each other during class. Demonstrate that respect by please, not talking out of turn during class, turning off your cell phone and instant messaging during class, and trying not to disturb class if you enter late or leave early.

If you are a student with a disability and you think that you need academic accommodations, contact the Office of Disability Services at 703-993-2472 or ods@gmu.edu immediately if you have not already done so. All academic accommodations must be arranged through that office. You must then bring the accommodation

recommendations to your instructor(s) immediately.

LEARNING OUTCOMES

This class is taught as Students as Scholars Scholarly Inquiry course, which means that you will be learning about the process of conducting research in vertebrate paleontology through reading assignments, a class project, lab activities, and other writing and presentation assignments. In particular, the class project will concentrate on how to form a testable hypotheses and what you will need to do to test this hypothesis. We will also stress how to find, evaluate, and use academic literature throughout the class. Through this process, you will learn both what we know about particular vertebrate fossils, but also what we still have yet to discover, and how much research there is still yet to do in this field. Specifically, you'll meet the following learning outcomes:

- Follow ethical principles in vertebrate paleontology and science in general
- Apply appropriate scholarly conventions when writing or performing data collection and analysis
- Develop your ability to comprehend and analyze scientific concepts, and to critically evaluate ideas
- Give you a better understanding of how vertebrates have evolve in a geological context
- Develop your skills in presenting scientific ideas in a clear and concise manner
- Develop analytical skills in paleontology

Students as Scholars is Mason's initiative to give students the opportunity to conduct undergraduate research. Check out OSCAR.gmu.edu or stop by the Office of Student Scholarship, Creative Activities, and Research to learn

about the many other programs they offer students. I'll also be sharing additional research opportunities (particularly in my own lab) as I hear about them, and I will be happy to meet with you if you have additional questions.

GRADING

Every week at least one, perhaps more than one, graded item will be due. Please make sure to check the Assignments section and the Calendar section of Blackboard so that you know what is due when. These graded items will consist of: quizzes, written assignments (including Wikis), papers, and exams. Your grade will be calculated as follows:

Quizzes + assignments: 20%, Exam 1 + Exam 2 30%: Final Exam: 20%, Presentation/Paper: 15%, Lab: 15%

Any assignment may be turned in late up until the last day of class (November 29, 2023), but 10% of the points will be taken off for every day it is late. You will receive a zero for work not completed by the last day of class.

If you miss a quiz or fail to turn in an assignment, you will receive a zero for that quiz or assignment, but the lowest of your quizzes + assignments will be automatically dropped from the grade calculation. Format for the paper and presentation will be discussed in class, and exemplar papers are available in the Course Content section of Blackboard. The final exam will include questions on material presented since the last test, as well as comprehensive questions from the entire semester.

Your participation grade will be based on your interactions in class and more importantly, your contributions to the lecture notes Wiki, and other course interactions. The Wiki tracks

how many times you add to or edit it, and what percentage of the material you edit. Thus, the more of the information you enter and edit, the better your participation grade will be. This is designed to not only encourage you to post lecture notes, but to actively add to the lecture notes, and to encourage you to edit what notes others post. This is also to discourage you from relying on one active member of your group to post all of the notes for your group.

If you enter an exam late, you may do so only before the first person leaves the exam. You will not be allowed to take the exam after the first person has left the exam after completion. Do not expect that a make-up exam will be given if you miss an exam. If classes (or just this class) are cancelled on the day of an exam, the exam will be given on the next scheduled class day when classes are in session.

Grade scale: A: 90-100 pts; B: 80-89 pts; C: 70-79 pts; D: 60-79 pts; F: 0-59 points. Plusses and minuses will be assigned within each letter category.

All students will be required to write a final paper on a genus of fossil vertebrate. The paper will be a review paper 10-15 pages long. You will be expected to choose a topic for your paper by mid-term, and review that topic with the instructor. You will need to do your own research on your chosen topic, and properly cite proper scientific sources of information. Students will present their papers in a 15-20 minute presentation in lab during the last two weeks of the semester.

LESSONS

********** **Introduction** **********

Reading Assignment: http://www.agiweb.org/news/evolution/foreword.html

Note Taking Group 1
Fossil of the Day: *Mammuthus*
https://en.wikipedia.org/wiki/Mammoth

https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=43266
http://www.earthtimes.org/scitech/yuka-ice-age-elephant-mammuthus-primigenius/1914/

August 21, 2023
12:00 PM - 01:15 PM
********** **Vertebrate Paleontology Basics** **********

Reading Assingment: Benton Chapter 2

Note Taking Group 2
Fossil of the Day: *Daimonelix* (trace fossil from *Palaeocastor*)

https://en.wikipedia.org/wiki/Palaeocastor

https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=209187

https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=41553

https://www.youtube.com/watch?v=tdfFoSC8_7k

August 23, 2023
12:00 PM - 01:15 PM
********** **Vertebrate Origins** **********

Reading Assignment: Benton Chapter 1

Note Taking Group 3
Fossil of the Day: *Pikaia*
https://en.wikipedia.org/wiki/Pikaia
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=34105
https://burgess-shale.rom.on.ca/en/fossil-gallery/view-species.php?id=101&ref=i&

August 28, 2023
12:00 PM - 01:15 PM
********** **Vertebrate Paleontology Research** **********

Reading Assignment: Uhen & Pyenson, 2011

Note Taking Group 4
Fossil of the Day: *Triceratops*
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=38862
https://en.wikipedia.org/wiki/Triceratops
https://www.si.edu/object/triceratops-horridus-marsh-1889:nmnhpaleobiology_3383580

August 30, 2023
12:00 PM - 01:15 PM
********** **Systematics** **********

Reading Assignment: http://www.ucmp.berkeley.edu/clad/clad4.html

Note Taking Group 1
Fossil of the Day: *Titanoboa*
https://en.wikipedia.org/wiki/Titanoboa
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=179038
https://www.smithsonianmag.com/science-nature/how-titanoboa-the-40-foot-long-

snake-was-found-115791429/

September 6, 2023
12:00 PM - 01:15 PM
********** **Early Paleozoic Fishes** **********

Reading Assignment: Benton Chapter 3

Note Taking Group 2
Fossil of the Day: *Dunkleosteus*
https://en.wikipedia.org/wiki/Dunkleosteus
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=34328
https://www.cmnh.org/dunk

September 11, 2023
12:00 PM - 01:15 PM
********** **Phylogenetic Reconstruction** **********

Reading Assignment: http://www.ucmp.berkeley.edu/clad/clad4.html

Note Taking Group 3
Fossil of the Day: *Uintatherium*
https://en.wikipedia.org/wiki/Uintatherium
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=40606

September 13, 2023
12:00 PM - 01:15 PM
********** **Early Tetrapods & Amphibians** **********

Reading Assignment: Benton Chapter 4

Note Taking Group 4
Fossil of the Day: *Tiktaalik*
https://en.wikipedia.org/wiki/Tiktaalik
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=77132
https://www.youtube.com/watch?v=yvDQCa7rleI

September 18, 2023
12:00 PM - 01:15 PM
********** **Evolution of Early Amniotes** **********

Reading Assignment: Benton Chapter 5

Note Taking Group 1
Fossil of the Day: *Mesosaurus*
https://en.wikipedia.org/wiki/Mesosaurus
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=36324

September 20, 2023
12:00 PM - 01:15 PM
********** **Exam I** **********

All material from the start of class to date will be covered.

September 25, 2023
12:00 PM - 01:15 PM
********** **Populations & Species** **********

Reading Assignment: http://evolution.berkeley.edu/evolibrary/article/evo_40; Via 2009

Note Taking Group 2
Fossil of the Day: *Hydrodamalis gigas*
https://en.wikipedia.org/wiki/Steller%27s_sea_cow
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=53136
https://animaldiversity.org/accounts/Hydrodamalis_gigas/

September 27, 2023
12:00 PM - 01:15 PM
********** Class Project **********

No note taking.

Fossil of the Day: *Diplocaulus*

https://en.wikipedia.org/wiki/Diplocaulus

https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=37264

October 2, 2023
12:00 PM - 01:15 PM
********** Triassic Tetrapoda & Post-Devonian Fishes **********

Reading Assignment: Benton parts of chapters 6, 7, 8

Note Taking Group 3
Fossil of the Day: *Carcharocles megalodon*
https://en.wikipedia.org/wiki/Megalodon
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=202672
https://extinctmonsters.net/2013/09/09/the-calvert-marine-museums-big-foam-shark/

October 4, 2023
12:00 PM - 01:15 PM
********** Growth & Form **********

Reading Assignment: Foote & Miller Chapter 2

Note Taking Group 4
Fossil of the Day: *Machimosaurus*
https://en.wikipedia.org/wiki/Machimosaurus
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=38341
https://www.nationalgeographic.com/news/2016/01/160111-ancient-crocodile-marine-largest-paleontology/

October 10, 2023
12:00 PM - 01:15 PM
********** Turtles, Marine Reptiles, Crocodiles & Pterosaurs **********

Reading Assignment: Benton Chapter 8

Note Taking Group 1
Fossil of the Day: *Odontochelys*
https://en.wikipedia.org/wiki/Odontochelys
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=137151
https://www.sciencemag.org/news/2008/11/sea-change-turtle-origins

October 11, 2023
12:00 PM - 01:15 PM
********** **DInosauria I** **********

Reading Asssignment: Benton Chapter 8

Note Taking Group 3
Fossil of the Day: *Allosaurus*
https://en.wikipedia.org/wiki/Allosaurus
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=38590
https://www.youtube.com/watch?v=YSGdowqESaQ

October 16, 2023
12:00 PM - 01:15 PM
********** **DIversification & Extinction** **********

Reading Assignment: http://evolution.berkeley.edu/evolibrary/news/061101_diversity; Ricklefs 2009

Note Taking Group 2
Fossil of the Day: *Squalodon*
https://en.wikipedia.org/wiki/Squalodon
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=36852

October 18, 2023
12:00 PM - 01:15 PM
********** **DInosauria II** **********

Reading Assignement: Benton Chapter 8

Note Taking Group 4
Fossil of the Day: *Brontosaurus*
https://en.wikipedia.org/wiki/Brontosaurus
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=52983
https://www.scientificamerican.com/article/the-brontosaurus-is-back1/

October 23, 2023
12:00 PM - 01:15 PM
Smithsonian Field Trip

Check out the virtual tours! Be sure to visit Deep Time, Human Origins, and Sant Ocean Halls for all of the great fossils on display.

********** **Aves** **********

Reading Assignement: Benton Chapter 9

Note Taking Group 1
Fossil of the Day: *Waimanu*
https://en.wikipedia.org/wiki/Waimanu
https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=139506
https://fossilpenguins.wordpress.com/2010/01/30/waimanu-the-first-penguin/

October 25, 2023
12:00 PM - 01:15 PM
********** **Lepidosauria and Mammal-Like Reptiles** **********

Reading Assignment: Benton parts of Chapters 8 & 10
Note Taking Group 2

Fossil of the Day: *Brachyrhinodon*
https://en.wikipedia.org/wiki/Brachyrhinodon
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=37813

October 30, 2023
12:00 PM - 01:15 PM
********** **Exam II** **********

All material since Exam I to date will be covered.

November 1, 2023
12:00 PM - 01:15 PM
********** **Mammalia I** **********

Reading Assignment: Benton Chapter 10
Note Taking Group 3

Fossil of the Day: *Morganucodon*
https://en.wikipedia.org/wiki/Morganucodon
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=39753
https://evolution.berkeley.edu/evolibrary/news/190502_mammals_chewing

November 6, 2023
12:00 PM - 01:15 PM
********** **Mammalia II** **********

Reading Assignment: Benton Chapter 10

Note Taking Group 4
Fossil of the Day: *Coryphodon*
https://en.wikipedia.org/wiki/Coryphodon
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=40574
https://lemur.duke.edu/fossil-fridays-coryphodon/

November 8, 2023
12:00 PM - 01:15 PM
********** **Paleoecology** **********

Reading Assignment: Foote & Miller Chapter 9

Note Taking Group 1

Fossil of the Day: *Icaronycteris*
https://en.wikipedia.org/wiki/Icaronycteris
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=40632

November 13, 2023
12:00 PM - 01:15 PM
********** **Mammalia III** **********

Benton Chapter 10

Note Taking Group 2

Fossil of the Day: *Notharctus*
https://en.wikipedia.org/wiki/Notharctus
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=40764
https://www.thirteen.org/programs/your-inner-fish/your-inner-fish-program-human-hand-gift-ancient-primates/

November 15, 2023
12:00 PM - 01:15 PM
********** **Marine Mammalia** **********

Reading Assignment: Uhen 2007, Uhen 2010

Note Taking Group 3
Fossil of the Day: *Basilosaurus*
https://en.wikipedia.org/wiki/Basilosaurus
https://www.paleobiodb.org/classic/basicTaxonInfo?taxon_no=36681
https://statesymbolsusa.org/symbol/alabama/state-dinosaur-or-fossil/basilosaurus-cetoides

November 20, 2023
12:00 PM - 01:15 PM
********** **Final Paper Presentations** **********

Each student will have 15 minutes to present their final paper/project to the class. I will post an order for the presentations here before the day of presentations. Presentations will continue into lab to ensure all students get to present.

Order of Presentation:

November 27, 2023
12:00 PM - 01:15 PM
********** **Human Evolution** **********

Reading Assignment: Benton Chapter 11

Note Taking Group 4

Fossil of the Day: *Homo floresiensis*

https://en.wikipedia.org/wiki/List_of_human_evolution_fossils

https://humanorigins.si.edu/evidence/human-fossils/species/homo-floresiensis

November 29, 2023
12:00 PM - 01:15 PM
********** **Final Exam** **********

Covers all material from the entire semester.

December 11, 2023
10:30 AM - 01:15 PM