

Geology 207. Dinosaur World

Course Description and Prerequisites

Survey of dinosaur paleobiology and paleoecology; terrestrial paleoclimate and paleoenvironments of the Mesozoic; dinosaur ancestors; appearance and radiation of dinosaurs; paleoecology and paleobiology of major dinosaur groups; extinction of large dinosaurs and the Cretaceous/Paleogene mass extinction; the appearance and ancestry of birds. Not open to students who have taken GEOL 307.

Prerequisites: none

Course Objectives and Learning Outcomes

The objective of Geology 207. Dinosaur World is to explore dinosaur paleobiology, paleoecology, and evolution in the context of Mesozoic environments and climate.

Learning outcomes:

1. Describe how the scientific method has led to our current understanding of the dinosaur ecology and evolution.
2. Interpret the origin and distribution of vertebrate fossils including dinosaurs.
3. Communicate the theory of natural selection to non-scientists.
4. Describe Mesozoic climate and plate configurations and evaluate how these may have shaped dinosaur evolution.
5. Create and interpret phylogenetic trees depicting evolutionary relationships among dinosaurs and living archosaurs (birds and crocodilians).
6. Describe the geologic evidence for the cause of the Cretaceous/Paleogene mass extinction and evaluate the effect of this mass extinction on the terrestrial biota.

Instructor: Anne Raymond (raymond@geo.tamu.edu, 845-0644)
Halbouty 161

Office hours: 1 hour/week, to be announced

Resources:

Required text: *Dinosaurs: The textbook, 6th Edition*, by Spencer Lucas.

The syllabus, course announcements, and some other materials will be posted during the semester on the course eCampus web site.

Lecture: 2 hours/week, meeting time and location to be announced

Lab: 3 hours/week, meeting time and location to be announced

Week	Topic:	Reading
1	The Mesozoic World <i>Lab: The Scientific Method and Historical Science</i>	Lucas, Ch. 10
2	Most vertebrates never become fossils <i>Lab: Sedimentary Rocks and Depositional Environments</i> <i>Fossil Preservation, Mystery Bone</i> <i>Handout and Discussion of Scientific Literature Searches</i> Lab Quiz 1	Lucas, Ch. 3, 11
3	Dinosaur Ancestors and natural selection	Lucas, Ch. 4

	Lecture Quiz 1 <i>Lab: Vertebrate Skeleton, Mystery Bone</i> Pick Group Members <i>Start Group Assignment 1: locating sources – journal articles and websites</i>	<i>Lucas, Appendix</i>
4	Prosauropods and Sauropods <i>Lab: Vertebrate Skeleton (cont.), Mystery Bone</i> <i>Cladistic (tree-thinking) exercise</i> Group Assignment 1 Due Pick Project Topic <i>Start Group Assignment 2: Project outline with 5 initial source articles and bibliography</i>	Lucas, Ch. 6 <i>Lucas, Appendix</i>
5	Dinosaur Metabolism: warm, cold or in between? <i>Lab: Excavation Stage 1</i> Lab Quiz 2	Lucas, Ch. 13
6	Ornithopods Lecture Quiz 2 <i>Lab: Excavation Stage 2</i>	Lucas, Ch. 7
7	Dinosaurs as parents <i>Lab: Excavation Stage 3</i> Lab Quiz 3 Group Assignment 2: Project Outline Due	Lucas, Ch. 7
8	Stegosaurus and Ankylosaurus <i>Lab: Excavation Stage 4</i> <i>Start Group Assignments 3 & 4</i>	Lucas, Ch. 8
9	Ceratopsians <i>Lab: Excavation Stage 5</i> <i>Group Assignment 2: Project Outline returned</i> <i>Continue Group Assignments 3 & 4</i>	Lucas, Ch. 9
10	Pachycephalosaurs Lecture Quiz 3 <i>Lab: Estimating Dinosaur Mass, Speed</i> Group Assignment 3: Site Map, Bone List, and Tentative ID Due <i>Start Preparations for Group Assignment 5 Group Project Presentation and 6 Revised Project Report</i>	Lucas, Ch.9 <i>Lucas, Ch. 11, 13 (review)</i>
11	Predatory Dinosaurs <i>Lab: Dinosaur Bone Types</i> <i>Endothermy vs. Exothermy, Bone Taphonomy</i> Lab Quiz 4 Group Assignment 4: Rough Draft of Project Report Due	Lucas, Ch. 5 <i>Lucas Ch. 13 (review)</i>
12	Predatory Dinosaurs Lecture Quiz 4 <i>Lab: Discussion - Is there a trade-off between size and speed?</i> <i>Papers:</i>	Lucas, Ch. 5

Myriam R. Hirt et al., A general scaling law reveals why the largest animals are not the fastest, *Nature Ecology & Evolution* (2017). DOI: [10.1038/s41559-017-0241-4](https://doi.org/10.1038/s41559-017-0241-4)
William I. Sellers et al. Investigating the running abilities of Tyrannosaurus rex using stress-constrained multibody dynamic analysis, *PeerJ* (2017). DOI: [10.7717/peerj.3420](https://doi.org/10.7717/peerj.3420)

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| 13 | The Extinction of Large Dinosaurs
<i>Lab: Presentation of Group Projects (Group Assignment 5)</i> | Lucas, Ch. 15 |
| 14 | Birds are Dinosaurs
<i>Lab: Hand in Lab Notebook</i>
<i>Group Assignment 6: Revised Project Report Due</i> | Lucas, Ch. 14 |
| 15 | Final Exam | |

Examination and Grading:

The course grade will be based on three quizzes (30%), the final exam (35%), and the laboratory (35%). Each of the lecture quizzes will carry equal weight. They will be closed book and will cover material presented in the text, lectures and the eCampus site. The final exam will be cumulative.

Make-up quizzes will be given if you have a university approved, documented excuse for missing the originally scheduled quiz. The documentation for the absence can be either the Texas A&M University Explanatory Statement or a confirmation of a visit to a health care professional affirming date and time of the visit. It is your responsibility to contact me before or as soon as possible after a quiz to arrange a make up. Make-up quizzes will be given normally one week after the scheduled quiz, immediately after class.

The grade scale is: 90-100=A, 80-89=B, 70-79=C, 60-69=D, 0-59=F.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

Plagiarism and the Honor Code

As commonly defined, plagiarism consists of passing off the ideas, words, writings, web site material, music, or video created by someone else as your own. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have permission of that person. Plagiarism is one of the worst academic sins, because it destroys the trust among colleagues.

If you are unsure about how to properly cite or reference your work, please ask the Teaching Assistant or your lecture professor for help. There are also numerous books and references in the library on proper citation and formatting. If you have any further questions concerning plagiarism, please consult the Aggie Honor Code, <http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules>

Attendance Policy

The University views class attendance as the responsibility of an individual student. Attendance, especially in courses with collaborative projects done in groups, is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at <http://student-rules.tamu.edu/rule07>."