

GEOL 104 Dinosaurs: A Natural History

Fall Semester 2015

Section 0101

PLS 1130 10:00-10:50 am MWF

Instructor: Dr. Thomas R. Holtz, Jr.

Room: Geology 4106 Office Hours: Th 1-3 pm, or by appointment

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NOTE: It is your responsibility as a student to completely read through and understand this syllabus. If you have questions about it, please contact Dr. Holtz. You will be held responsible for following all requirements of this syllabus.

Course Description: Dinosaurs, their evolution, and our understanding of their fossil record. Students will examine the geologic record and the tools used by paleontologists to determine: geologic ages and ancient environments; evolutionary history and extinctions; dinosaurian biology and behavior; and their survival as birds. Mechanisms of global change ranging from plate tectonics to asteroid impact will be discussed.

Learning Outcomes: By the end of the semester, every student should be able to:

- Identify the major clades of dinosaurs and their primary attributes (anatomy, behavior, stratigraphic and geographic distribution, etc.)
- Interpret cladograms in determining evolutionary relationships and distribution of specializations
- Assess claims of inferred dinosaurian behavior, physiology, and extinction patterns from fossil evidence

Themes: This course examines how scientists study the age, environments, evolution, origin, biology, behavior, and extinction of dinosaurs and the other inhabitants of their world. Over this time we will explore several big themes:

- The scale of geologic and evolutionary time
- Biological evolution and the origin, evolution, and diversification (and occasional extinction) of branches of the Tree of Life
- The nature of scientific knowledge, and how diverse lines of evidence are used to reconstruct events of the ancient past
- What an understanding of dinosaurian biology, behavior, ecology, and extinction can reveal about modern environmental conditions

Textbook: No required textbook for purchase. However, please keep current with the online lecture notes (<http://www.geol.umd.edu/~tholtz/G104/104Syl.html>)

Course Organization: 3 meetings per week (Monday, Wednesday, Friday).

Grade:	Midterm Exam 1:	25%	Online Quizzes:	10%
	Midterm Exam 2:	25%	In-class Participation Quizzes:	10%
	Final Exam:	25%	Smithsonian Field Trip Project:	5%
	EXTRA CREDIT POINTS for Course Evaluation			

NOTE: Online quizzes and Smithsonian Field Trip projects cannot be completed for a grade after their regularly assigned due date passes.

Grade Scale: The numbers given represent the thresholds that must be passed in order to reach that grade (for example, A+ is 97.000... and any number greater). There is no rounding for letter grades; the thresholds must be passed. F is any grade below D-. Thresholds: 97, A+; 93, A; 90, A-; 87, B+; 83, B; 80, B-; 77, C+; 73, C; 70, C-; 67, D+; 63, D; 60, D-; < 60, F.

The Final Grade is the algebraic sum based on the numerical grades.

Midterm Exams: Two mid-term exams are scheduled for this course. They combine true/false, multiple choice, matching, identification, fill-in-the-blank, short answer, and short essay questions. They are held during regular lecture periods. The dates for these exams are **October 7** and **November 11**. Absences from exams will not be excused except for those causes approved by University policy (see <http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540> in the University of Maryland Undergraduate Catalog). Only those students excused for these causes will be eligible for a make-up exam.

Final Exam: The final exam has a similar format to the mid-term exams. It is cumulative for the entire course, but with a special emphasis on the material since the second exam. **NOTE:** This exam is on **Saturday, December 19**. Please plan your winter schedule accordingly!! Again, absences from exams will not be excused except for those causes approved by University policy in the University of Maryland Undergraduate Catalog). Only those students excused for these causes will be eligible for a make-up exam.

Online Quizzes: There will be a series of online quizzes, administered through ELMS, throughout the course. For each of these you will have between 11 am two days before they are due until 11:55 pm the day they are due in which to complete them. These quizzes will be open-note, but they ARE subject to the Honor Pledge: you may not seek help from other people in doing these. The questions, the order in which they are asked, and the order of the answers are randomized, so no two student's exams will be identical. The lowest quiz grade will be automatically dropped; if you miss a quiz for any reason, it will be accommodated in this fashion. However, only one quiz at most will be dropped.

In-class Participation Quizzes: An essential element of education in general is attending lectures and reflecting on the information provided there. In order to help guide this reflection and understanding, a series of In-class quizzes and surveys will be presented during the class. These will not be announced in advance, and may occur at any time in any given lecture. Not every lecture will have such a quiz, but some may have more than one. You are expected to be present and ready to answer the quizzes and surveys whenever they are offered (sometimes more than once in a given lecture). Prior to Sept. 15 (the last day of Add/Drop) the quizzes will not count to the final course grade; following that point quizzes will be graded. The grades are based on the summed total for that day's quizzes. The lowest three day's grades will be automatically dropped: this is the method by which absences due to illness, travel, etc. will be dealt. These quizzes may be individual or group quizzes. **PLEASE make certain that you have a pen or pencil at every class!**

Smithsonian Field Trip Report: To take advantage of our proximity to the Smithsonian Institution National Museum of Natural History and its excellent display of fossil materials, there is a small assignment requiring you to go to that museum and answer a series of questions based on your observations. There is no single formal field trip; you may go on your own or in small groups. The project is due online **NOVEMBER 16**.

EXTRA CREDIT Course Evaluations: CourseEvalUM will be open for students to complete their evaluations for Fall 2015 courses between Tuesday, December 1 and Sunday, December 13. Students can go directly to <http://www.courseevalum.edu> to complete their evaluations, beginning December 1. You will be alerted about these dates and provided more information closer to that time, and students will be alerted via their official University e-mail account.

Students who complete evaluations for all of their courses in the previous semester (excluding summer), can access the posted results via Testudo's CourseEvalUM Reporting link for any course on campus that has at least a 70% response rate. You can find more information, including periodic updates, at the IRPA course evaluation website (https://www.irpa.umd.edu/Assessment/CourseEval/fac_faq_shtml). The expectation is that all students will complete these. This is YOUR chance to anonymously evaluate this class: please use this opportunity!

In order to reward good citizenship, the class as a total will receive +1 percentage point if at least 70% of the students do the Course Evaluation and a +2 if 90% or more!

Otherwise, no separate extra credit assignments as such planned for this course, although individual exams and homework assignments may have extra credit questions which add up in the final course grade.

Websites: <http://www.geol.umd.edu/~tholtz/G104/>

This Website contains a copy of the course policies, the syllabus, lecture notes, copies of some of the handouts, dinosaur-related web links, and other features. Please feel free to utilize this resource, and email Dr. Holtz with any suggestions on improving this resource.

<http://elms.umd.edu/>

The ELMS Canvas site will include required online quizzes; announcements concerning the class; class discussion list; copies of the handouts; and so forth. If you have not already done so, make sure that you get access to ELMS.

Policies:

Academic integrity: The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu/SHC/Default.aspx>

The University of Maryland is one of a small number of universities with a student-administered Honors Code and an Honors Pledge, available on the web at <http://shc.umd.edu/SHC/HonorPledgeInformation.aspx>. The code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. The University Senate encourages instructors to ask students to write the following signed statement on each examination or assignment: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment)."

Thus, in GEOL104, work submitted under your name, even for extra credit, must **unambiguously** be exclusively your own. Any evidence of dishonesty on any graded assignment will result in a referral to the Office of Student Conduct. **Note that Geology regards the unauthorized distribution of any course materials as constituting facilitation of academic dishonesty and will report this to the OSC.**

Academic Accommodations: If you have a documented disability, you should contact Disability Support Services 0126 Shoemaker Hall. Each semester students with documented disabilities should apply to DSS for accommodation request forms which you can provide to your professors as proof of your eligibility for accommodations. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS web site at <http://counseling.umd.edu/DSS/registration.php>.

Religious Observances: The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs, students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance. **Notice should be provided as soon as possible but no later than the end of the schedule adjustment period (September 14).** Faculty should further remind students that prior notification is especially important in connection with final exams, since failure to reschedule a final exam before the conclusion of the final examination period may result in loss of credits during the semester. The problem is especially likely to arise when final exams are scheduled on Saturdays.

Laptop/Tablet/Smartphone Use: Recent studies have shown that:

- People who take notes using pen/pencil and paper more effectively process and master the material, especially with regards to their ability to answer conceptual questions. (Also, taking notes by hand allows easier doodling, which has been shown to promote focus and memory).

- More importantly, people using laptops are likely to start multitasking (pulling up social media; watching videos; playing games; doing work for other classes; etc.) and that such multitasking is detrimental to the both the student doing it and all students within view of that screen.

Because of this, and because of past bad experience, smartphones, tablets, laptops, and all other modes of electronic communication must be **turned off** and **stowed away** during class time. (NOTE: using your smartphone between your legs underneath the desk is NOT “stowed away”, and you aren’t and have never fooled a teacher or instructor when you try that...) If you are using the device for recording lectures, please activate them then leave them untouched for the remainder of the lecture. Apologies to those students who prefer to use this method to take notes, but this is the only effective way of dealing with the bad actors.

That said, there may be some group activities in which we will use individual laptops/tablets/smartphones in class. Dr. Holtz will make every effort to inform you about this in advance. However, in those situations you may only use these devices for the task at hand.

(NOTE: if you have a reason for using laptops for note taking approved by the Disability Support Service, please bring that to the attention of both Dr. Holtz prior to using them in class, and please make a copy of a DSS note to that affect available for our records.)

Miscellaneous: All work on tests, assignments, exams, etc. must be your own. Although group study can be very useful, make sure that all your work you turn in is your own.

Throughout the course there will be a series of online quizzes using the ELMS system. Please make certain that you stay current with these: once the deadline has passed, you will not be able to make them up and you will receive a 0 for that test.

Attendance in class is expected. If you cannot make a certain lecture, try and find another student who might lend your their notes. (In fact, establishing a study group early in the course has proven useful for many students in the past). Furthermore, In-class Participation Quizzes can only be completed in class.

In cases of inclement weather or other unexpected emergencies, the University may close. Please consult the University main webpage (<http://www.umd.edu>) or call 301-405-7669 (SNOW) to confirm such cancellations. Dr. Holtz will contact students via ELMS in order to inform them concerning delays of due dates for projects to be handed in or for exams: typically these will be shifted until the next available class date.

Keep up with the online notes! Although the format of the lectures and the notes do not always match, these readings are important as well. Readings should be done **prior** to the classtime they are listed.

NOTE: As part of the nature of the course, there will be a lot of memorization (less than a foreign language class, but more than that found in more mathematically-oriented introductory science classes). This will include lots of anatomical, geological, and paleontological terms, as well as evolutionary and temporal relationships. If you have difficulty memorizing, this may not be the class for you. Also, if there are words or concepts with which you are not familiar, feel free to ask Dr. Holtz (in class, after class, over email, etc.) for an explanation or clarification.

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MAIN SYLLABUS

Aug. 31 Introduction to the Course; What are Dinosaurs?

Sept. 2 What is Science? The Meaning of Fossils

- Sept. 4 The History of Prehistory: the Great Exposition through Great Expeditions
- Sept. 7 LABOR DAY – NO CLASS MEETING
- Sept. 9 Pages in the Book of Time: Sedimentary Rocks
- Sept. 11 Bones in the Stones: Fossils and Fossilization
Quiz 1 due
- Sept. 14 Deep Time I: Ruins of an Older World
- Sept. 16 Deep Time II: Plate Tectonics and the Earth Engine
- Sept. 18 The Living Earth: Ecology
- Sept. 21 Our Bodies, Our Selves: Introduction to Vertebrate Osteology
- Sept. 23 Taxonomy and Species
Quiz 2 due
- Sept. 25 Evolution I: Descent with Modification
- Sept. 28 Evolution II: On the Origin of Species by Means of Natural Selection
- Sept. 30 Evolution III: Patterns and Processes
- Oct. 2 Systematics I: The Tree of Life
- Oct. 5 Systematics II: Tree-Based Thinking
Quiz 3 due
- Oct. 7 **MIDTERM EXAM I**
- Oct. 9 The Colonization of Land
- Oct. 12 Life on Land Before the Dinosaurs
- Oct. 14 ***WATCH ON ELMS:*** The Rise of the Dinosaurs
- Oct. 16 ***WATCH ON ELMS:*** Thyreophora: Defense! Defense! Defense!
Quiz 4 due
- Oct. 19 Ornithopoda: Beaks, Bills & Crests
- Oct. 21 Marginocephalia: That's Using Your Head!
- Oct. 23 Sauropodomorpha I: Dawn of the Thunder
- Oct. 26 Sauropodomorpha II, Neosauropoda: Size Matters! & Theropoda I: Basal Theropods
- Oct. 28 Theropoda II: Dinosaurs Red in Tooth and Claw
Quiz 5 due
- Oct. 30 Theropoda III, Coelurosauria: Tyrant Kings and Lesser Royals

- Nov. 2 Theropoda IV, Maniraptora: The Feathered Dinosaurs
- Nov. 4 Theropoda V: Rise of Birds & Dinosaurs Take Flight
- Nov. 6 The Worlds of Dinosaurs: Dinosaur Paleocology
- Nov. 9 Dinosaur Olympics: Locomotion and Dinosaurs in the World of Physics
Quiz 6 due
- Nov. 11 **MIDTERM EXAM II**
- Nov. 13 Through the Eyes of a Dinosaur: Dinosaur Senses
- Nov. 16 *Tyrannosaurus* Sex: Dinosaur Social Behavior
Smithsonian Field Trip Project due online
- Nov. 18 Bringing Up Baby: Dinosaur Families and Growth
- Nov. 20 The Hot-Blooded Dinosaurs
Quiz 7 due
- Nov. 23 Heart Beats & Deep Breaths
- Nov. 25 So You Want To Be An Endotherm?
- Nov. 26-27 **Thanksgiving Recess: enjoy your roasted maniraptoran**
- Nov. 30 Dinosaur Physiology roundup
- Dec. 2 Dragons of the Sea and Air: Marine Reptiles and Pterosaurs
Quiz 8 due
- Dec. 4 In the Shadow of the Dinosaurs: Mesozoic Mammals and Plants
- Dec. 7 The Cretaceous-Paleogene Extinction I: All Good Things...
- Dec. 9 The Cretaceous-Paleogene Extinction II: One REALLY Bad Day!
- Dec. 11 The Cretaceous-Paleogene Extinction III: End of an Era
Quiz 9 due
- Dec. 19 (**SATURDAY!!**) **FINAL EXAM**, PLS 1130, 8:00-10:00 am