

EVOLUTION AND EXTINCTION OF THE DINOSAURS

GEO 102 (Spring, 20XX)

Course Description: This course is an introduction to Dinosauria. We'll first understand who the dinosaurs were (their diversity), and then think about some of the larger questions that one might ask about dinosaurs: for example, whether they were warm-blooded, why we think that birds are living dinosaurs, and how non-bird dinosaurs went extinct. In doing so, we'll learn something about the natural world, natural history, and the way that science works, including how we might distinguish between interesting, functional scientific hypotheses and attractive, but ill-conceived ideas.

They say we live in the "Age of Mammals," but with only ~4500 species of living mammals vs. ~10,000 species of living birds, welcome to the "Age of Dinosaurs!"

Outcomes: GEO 102 uses dinosaurs as vehicle to teach fundamental concepts in the natural sciences and evolutionary biology. It works at three levels:

- I. introducing the logic and language of the natural sciences (in particular, a historical science);
- II. developing a modern, balanced view of the vertebrate biota and its evolutionary history; and
- III. developing a feeling for legitimate science vs. "pseudoscience."

Objectives:

Level I

- an introduction to and experience in the use of phylogenetic systematics;
- an understanding of hypothesis development, testability, and parsimony in science;

Level II

- introduces a modern view of amniote phylogeny (in which familiar, but imprecise terms like "reptile" and "bird" for more evolutionarily meaningful terms like "diapsid," "synapsid," and "amniote");
- introduces the logic of evolutionary thought;
- introduces basic principles of comparative anatomy, functional morphology, and physiology; and
- encourages an opportunity to imagine *and assess* worlds different from our own.

Level III

- An introduction to peer-review and how an account becomes authoritative; and
- An introduction to the potential pitfalls of popular science.
- **Instructor:** D. E. Fastovsky; Office: 313 Woodward Hall; Hours: MWF: anytime you can find me; T, Th, not at all; and by appointment, of course); phone: 401-874-2185; email: defastov@uri.edu.
- **Required Text:** Fastovsky, D.E., and Weishampel, D.B., 2016, Dinosaurs: A Concise Natural History (third edition): Cambridge University Press, New York, (*in press*).
- **Grading:** 3 exams (non-cumulative) @ 15% of the grade each; drop the lowest; 1 final (cumulative) @ 30% of the final grade. Two written team-based assignments; total 25%. *Grades will not be curved.* Exams include a combination of short (1 – 3 sentence) answers, T/F questions (in which *most* of the grade depends upon the explanation you

provide about why you answered what you did; fill-in-the-blanks, cladograms (which you'll meet in this class), and identifications (of dinosaurs and their parts).

- **Late Work:** Late work is generally not accepted.

The (not so fine) Print:

Grade Scale: 100 – 93% (A); 92 – 90 (A-); 89 – 88 (B+) 87 – 83 (B); 82 – 80 (B-); 79 – 78 (C+); 77 – 73 (C); 72 – 70 (C-), & etc.

Academic Honesty: All submitted work must be your own. When you consult other sources (class readings, articles, books, or internet resources, these must be properly documented or you will be charged with plagiarism and the incident will go on your record in the Office of Student Life; that's not my discretion, it's a University rule. If you have any doubt about what constitutes plagiarism, I will gladly point you to some resources to help you.

Make-up Policy: There will be no make-up examinations. In the case of legitimate conflicts, notification required at least one week before the regularly scheduled examination. In the case of deaths, accidents, or sickness, notification required within a week of the regularly scheduled examination time. *All excuses must be in writing.*

Disabilities: Any student with a documented disability is welcome to contact me as early in the semester as possible so that we may arrange reasonable accommodations. As part of this process, please be in touch with URI's Office of Disability Services, located in Room 330 of the Memorial Union (874-2098).

Illness Due to Flu

The nation is experiencing widespread influenza-like illness. If any of us develop flu-like symptoms, we are being advised to stay home until the fever has subsided for 24 hours. So, if you exhibit such symptoms, please do not come to class. Notify me at 874-2185 or defastov@uri.edu of your status, and we will communicate through the medium we have established for the class. We will work together to ensure that course instruction and work is completed for the semester.

The Centers for Disease Control and Prevention have posted simple methods to avoid transmission of illness. These include: covering your mouth and nose with tissue when coughing or sneezing; frequent washing or sanitizing your hands; avoiding touching your eyes, nose, and mouth; and staying home when you are sick. For more information please view www.cdc.gov/flu or [flu.gov](http://www.flu.gov) <<http://www.cdc.gov/flu%20or%20flu.gov>> . URI Health Services web page, www.health.uri.edu <<http://www.health.uri.edu>> , will carry advice and local updates.

General Note: The schedule that follows is an outline of proposed events. It is subject to variation as the lectures progress; however, examination dates will not change. Assignments might be potentially delayed due to unforeseen circumstances; they will never be made earlier.

Schedule

The following is an *approximate guide* to when topics will be covered; the dates for examinations, however, are firm. Exams are always only on material covered (or assigned); you will not be tested on material that has not been covered in class (or assigned in readings pertaining to what has been covered in class).

Week 1 (Jan. XX): Course introduction; collecting dinosaurs; geological time

Reading: Chapters 1 -2.

Week 2 (Jan. XX Feb. XX): geological time; phylogeny

Reading: Chapter 3

Week 3 (Feb. XX): phylogeny; Dinosaurs: Ornithischia vs. Saurischia

Reading: Chapter 4

Week 4 (Feb. XX): dinosaurs: Ornithischia: Thyreophora – **Stegosauria & Ankylosauria**

Reading: Chapter 5

In-term I: Friday, February XX, in class

Week 5 (Feb. XX): dinosaurs: Ornithischia: **Marginocephalia: Ceratopsia &**

Pachycephalosauria

Reading: Chapters 6, 7

Week 6 (Feb. XX, Mar. XX): dinosaurs: Ornithischia: **Ceratopsia and Ornithopoda**

Reading: Chapter 7

Week 7 (Mar. XX): dinosaurs: Ornithischia - **Ornithopoda**

Reading: Chapter 8.

First written assignment due, 8:30 am, uploaded in Sakai

Week 8 (Mar. XX)

SPRING BREAK

Week 9 (Mar. XX): dinosaurs: Saurischia: **Theropoda**

Reading: Part III; Chapter 9

In-term II: Friday, March XX, in class

Week 10 (Mar. XX) dinosaurs: Saurischia: **Theropoda**

Reading: Chapter 9

Week 11 (Apr. XX) dinosaurs: Saurischia: **Theropoda** - birds as dinosaurs

Reading: Chapter 10, 11

Week 12 (Apr. XX) Physiology: "hot-blooded" vs. "cold-blooded" dinosaurs

Reading: Chapter 12

Week 13 (April XX): Origin of dinosaurs

Reading: Chapter 15!

Interm III: Friday, April 19, in class

Week 14 (April XX) - Dinosaur extinction

Reading: Chapter 16

Second written assignment due, 8:30 am, uploaded in Sakai

Week 15 (April XX; May XX) - Dinosaur extinction

Reading: Chapter 16.

FINAL EXAMINATION: May XX at XX am, location