

**Paleontology: GEOS 416**  
**SYLLABUS: Spring 2012**

---

**Description and Objectives**

This course will introduce you to the basic principles used in the study of paleontology, illustrate how paleontology can be applied to both the geological and biological sciences (for example: macroevolution, paleoecology, biostratigraphy, and biogeography), and, at the same time, review the basic morphology, biology, and phylogeny of the major groups of organisms. The lecture and laboratory exercises are designed to complement each other. Lab exercises will be incorporated into the lectures and will be used to reinforce major topics. There will also be between 1 and 2 required field trips, and for at least one of these a fee will be assessed for travel expenses.

---

**Course Information**

**Instructor:** Dr. Karl W. Leonard

**Office:** King Hall 204/205

**Phone:** (218) 477-2682

**e-mail:** [leonardk@mnstate.edu](mailto:leonardk@mnstate.edu)

**url:** <http://web.mnstate.edu/leonard>

**office hours:** M,W, F 1:30-3:30, T & Th 10:00-12:00 pm, or whenever I'm in my office

**Textbooks:** Benton & Harper (2009). Paleobiology and the Fossil Record, 1<sup>st</sup> edition, Wiley-Blackwell.

Additional references will come from the instructor, and additional readings will come from articles provided by the instructor.

**Class web page** can be found on: <http://web.mnstate.edu/leonard>

---

**Evaluation/Grading**

Exam and quiz grades will be done on a 100-point scale where 90-100=A, 80-89=B, 70-79=C, 60-69=D etc. Making up missed labs will not be possible, and making up missed exams will only be allowed in extreme cases....

<b>Lecture: EXAMS (3)</b>	<b>- 50%</b>
<b>Reading Quizzes</b>	<b>- 05%</b>
<b>Discussions</b>	<b>- 05%</b>
<b>Laboratory: EXERCISES</b>	<b>- 30%</b>
<b>Class Project:</b>	<b>- 10%</b>
<b>_____ TOTAL =</b>	<b>100%</b>

**"Lecture" Format:**

I would like to encourage class discussion during our meetings. Material covered in the course is often very conceptual and controversial -- lots of room for differing opinions and debate. We will also be reading, on occasion, conflicting research papers specifically for discussion and for the laboratory exercises.

**Field Trip, Class Project, and Summary Paper:**

The best way to gain an appreciation of how paleontologic research is conducted is to actually experience it for yourself. To do this I would like each student to be responsible for one aspect of a class-wide research project. I've got a few project ideas that concern some very fossiliferous, Upper Devonian rocks in north-central Iowa, and Ordovician rocks in southeastern Minnesota. Collection of the necessary field data will require 1 day of field work; in addition, a few hours in the laboratory after the fossil collections are made may be required. Students will conduct field work, laboratory preparation, and data manipulation in groups, but each student will be responsible for their own written paper (a 5-7 page scientific research paper plus figures).

**Laboratory Exercises:**

Lab exercises will be incorporated into the lecture at least once every two weeks. Many of the meetings will be devoted to particular groups of fossils (see schedule). Most exercises can be completed in class, though some additional "in lab" time may be required. Other labs will utilize computer simulations to stress important concepts or methods, or utilize various pieces of research equipment in order to experience what is known as "experimental paleontology". Towards the end of the semester additional lab time will be devoted to working on material collected for the class projects.

---

**Policies**

**Attendance:** Students are expected to attend all class meetings.

**Special Accommodations:** Students with disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Coordinator of Disability Services at 477-4318 (Voice) or 1-800-627-3529 (MRS/TTY), FR154 as soon as possible to ensure that accommodations are implemented in a timely fashion.

**Academic Honesty:** Students taking this course will be expected to abide by the university policies listed in the student handbook (<http://www.mnstate.edu/sthandbook/>)

<b>Lecture Schedule (Tentative)</b>		
<b>Week</b>	<b>Topic</b>	<b>Reading</b>
1 Jan. 10	T- Introduction & What are fossils? Th Taphonomy and Preservation	B & H Ch. 1 B & H Ch. 3
2 Jan. 17	T- Taphonomy and Preservation Th -Lab 1: Preservation and Taphonomy	B & H Ch. 3
3 Jan. 24	T - Nature of the Fossil and Strat. Record Th - Variation and Species in the Fossil Record	B & H Ch. 3
4 Jan. 31	T - Invertebrate Organization Th - Lab 2: Porifera	B & H Ch.10 B & H Ch. 11
5 Feb. 7	T – Systematics & Phylogeny Th - <b>EXAM # 1 – Feb. 9</b>	B & H Ch. 10
6 Feb. 14	T - Evolution I Th - Lab 3: Cnidaria	B & H Ch. 5, 8 B & H Ch. 10
7 Feb. 21	T - Evolution II Th – Lab 4 Lophophorates : Bryozoans and Brachiopods	B & H Ch. 5, 8 B & H Ch. 12
8 Feb. 28	T - Diversification and the 3 Great Faunas Th - Lab 5: Molluscs 1 – Bivalves & Gastropods	B & H Ch. 20 B & H Ch. 113
9 Mar. 6	T - Extinction Th – Extinction	B & H Ch. 7
<b>March 12 – 16 = Spring Break</b>		
10 Mar. 20	T – Extinction Th - <b>EXAM # 2 – Mar. 22</b>	
11 Mar. 27	T - Adaptation and Functional Morphology Th Lab 7: Cladistics Exercise	B & H Ch. 6
12 April 3	T - Paleoecology Th - Lab 8: Echinoderms	B & H Ch. 4 B & H Ch. 15
13 April 10	T - Paleoecology Th – Biostratigraphy	B & H Ch. 2
14 April 17	T - No Class - SAC Th - Biostratigraphy	
15 April 24	T – Reefs Through Time - Learning from the past Th – Lab 9: Arthropods	handout B & H Ch. 14
16 May 1	T - Lab 10: Project	
<b>Final Exam (EXAM # 3) – May 4<sup>th</sup> – 3:00 pm</b>		