

## EVOLUTION OF VERTEBRATE LIFE

BIOL 276 2011 Spring  
2:00-3:15 pm T Th  
Coker 201

Dr KW Sockman  
Wilson G43  
3:15-4:00 pm T Th

### TEXT

Pough FH, Janis CM, Heiser JB. 2009. Vertebrate Life, 7th or 8th ed. Upper Saddle River, San Francisco: Pearson.

### WEBSITE

You can access the course website through Blackboard.com

([https://blackboard.unc.edu/webapps/portal/frameset.jsp?tab\\_id=\\_2\\_1&url=%2fwebapps%2fblackboard%2fexecute%2flauncher%3ftype%3dCourse%26id%3d\\_364413\\_1%26url%3d](https://blackboard.unc.edu/webapps/portal/frameset.jsp?tab_id=_2_1&url=%2fwebapps%2fblackboard%2fexecute%2flauncher%3ftype%3dCourse%26id%3d_364413_1%26url%3d)).

### COURSE DESCRIPTION

This course presents an evolutionary history of the vertebrates, with emphasis on the anatomical, physiological, and behavioral adaptations accompanying major transitions, such as the move from water to land and the development of complex integrating systems coinciding with the evolution of increased activity. The course is divided into segments. Initially, we review fundamental concepts in anatomy and evolution; the evolution of life forms that eventually gave rise to the vertebrates; the diversity and phylogenetic history of the vertebrates themselves; basic vertebrate structure; and the evolution of a significant innovation, the vertebrate jaw. Then we will examine the evolution of the non-amniotic vertebrates, the "fishes" and amphibians; living in an aquatic environment; and the transition to living on land. We follow this with a focus on the Sauropsida, which includes turtles, Lepidosauria, and birds. This segment includes an examination of another remarkable evolutionary innovation and model system for the study of brain and language evolution, the avian song system. We culminate with an examination of the evolution of the Synapsida, which includes mammals, and the eventual evolution of humans. This segment closes with a brief look at how our own evolution has affected vertebrate diversity.

### GRADING

I will give two mid-term exams, each worth 30%, and a final exam, worth 40% of your semester grade. The final is partially cumulative. Each of these exams will be short-answer in format. If you miss an exam and provide me with a valid, written excuse from the Dean's office, I will offer a make-up with an essay format.

I will design exams and assign grades based on the definitions of permanent grades provided in the UNC Undergraduate Bulletin (<http://www.unc.edu/ugradbulletin/>). If you feel your exam was not evaluated fairly or a mistake was made, then within one week of receiving your exam back, you must submit a typed, hard copy (not by e-mail) letter requesting that I re-grade the entire exam.

#### CONDUCT AND RESPONSIBILITY

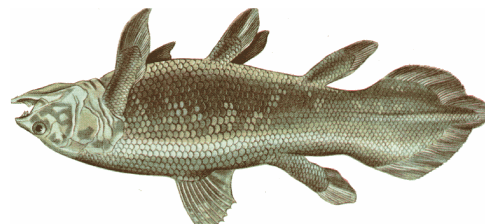
Due to the abundance of e-mails and telephone calls I receive, it is likely that I will not be able to respond to any e-mails or telephone calls from you. Thus, I do not encourage you to e-mail me or telephone me with questions or comments. Instead, there is plenty of time during class, after class, or during a visit to my office for questions. During lecture, I encourage questions or comments directed at me on subject matter relevant to the course. You are free to vocalize *reasoned* exception to the viewpoints. That is, comments or questions must be based in fact, not faith. Moreover, this freedom does not absolve you of your responsibility to learn the course content.

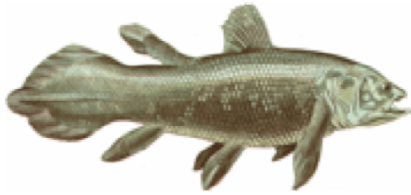
You and I are required to abide by the UNC honor code (<http://honor.unc.edu/>) in all it subsumes, including issues of cheating and classroom disruption. To that end, mobile telephones and any other electronic or noise-making device must be silent during lecture and off and stowed out of sight during exams. Because it is disruptive, you should not arrive late to or leave early from class. Other than a pencil and the exam itself, all material (including but not limited to notes, books, or electronic devices) must be stowed out of sight during exams. During an exam, if you appear to use or handle anything other than a pencil and the exam itself, if you appear to communicate with anyone other than me or an exam proctor, if you appear to look at another's test or other potential sources of information, or if you appear to receive assistance from or give assistance to anyone or anything, you may be in violation of the UNC honor code, and I will be obliged to report the incident. You may not wear a hat or dark glasses during the exam, and you may not get up and leave an exam until you are finished and have turned it in, unless I first grant you permission to do so. You will not be permitted to take the exam if you arrive late.

It is expected that the Honor Code of the University of North Carolina will be observed in this class at all times. The passing or selling of course materials to a commercial publishing system is in violation of the UNC Honor Code.

Lectures and reading are designed to complement one another and are both essential elements of the course. Should you miss a lecture, you should immediately obtain, copy, and study notes from a trusted and studious classmate. Additionally, I will deliver lectures under the assumption that you have done the reading before class and thus already know the material to some extent. One of the goals of my lectures will be to emphasize information from the reading, as well as information not in the reading, that I expect you to know and on which you may be tested. I will not state explicitly what will be on any exam. Instead, it is your job to divine possible exam material from lecture emphases.

You should check daily the course website for class material and information. The material I provide on the website is not a surrogate for reading or for lecture attendance.





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BIOL 276 2011 SPRING DR KW SOCKMAN

LECTURE	DATE*	READING**	LECTURE TOPIC OR EXAM
1	11-Jan		Introduction to course and to the evolution of vertebrate life
2	13-Jan	1	Diversity and classification of vertebrates, general principles of evolutionary relationships
3	18-Jan	2	General vertebrate structure and relationships to other animals
4	20-Jan	3	Early vertebrates and the origin of jaws
5	25-Jan	4	Sensory and physiological aspects of living in the aquatic environment
6	27-Jan	5	The Chondrichthyes: sharks, skates, rays, and relatives
7	1-Feb	6	The major radiation of fishes: bony, ray-finned, and lobe-finned fishes
8	3-Feb	7,8	Conditions of the Paleozoic and the evolution of terrestrial life
	8-Feb		<b>Exam 1</b>
9	10-Feb	9	Evolution of tetrapods: from origin to amniotes
10	15-Feb	10	Amphibian diversity
	17-Feb		Exam 1 Review Session
11	22-Feb	11	Synapsids, Sauropsids, and their different approaches to terrestrial life
12	24-Feb	12	Turtle evolution
13	1-Mar	13	The Lepidosaur: tuatara, lizards, and snakes
14	3-Mar	14, 15	Ectothermy; Conditions of the Mesozoic
	8-Mar		Spring Break, no lecture
	10-Mar		Spring Break, no lecture
15	15-Mar	16	The Diapsids: dinosaurs, crocodylians, and birds
16	17-Mar	17	Avian diversity: structure, flight, feeding, and sensory systems
	22-Mar		<b>Exam 2</b>
17	24-Mar	TBA	Bird song, bird brains, and the evolution of vocal learning and language in humans
18	29-Mar	18,19	Origin of Synapsida and mammals; Conditions of the Cenozoic
	31-Mar		Exam 2 Review Session
19	5-Apr	20	Diversity of mammals
20	7-Apr	21	Mammalian reproduction, feeding, locomotion, and evolution of an aquatic lifestyle
21	12-Apr	22	Endothermy
22	14-Apr	23	Sociality and ecology of mammals
23	19-Apr	24	Evolution of primates
24	21-Apr	25	On humans, extinction, and conservation
25	26-Apr		Catch-up and/or review
	30-Apr		<b>Final at 4:00 p.m.</b>

\*Dates are accurate for exams but are estimates for lecture topics.

\*\* Chapter(s) to be read before the lecture. From: Pough FH, Janis CM, Heiser JB. 2009. Vertebrate Life, 7th or 8th ed. Upper Saddle River, San Francisco: Pearson.