Biology 347, Biology of Vertebrates, Fall 2021
Lectures MWF 9:30-10:20 AM in ISC 137
Lab Tues 1:00-3:50 PM in ISC 105

Instructor:
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Office Hours:
Monday 12:30–2:30 & Thursday 10:00–12:00, or by appointment.

Textbook:
Pough, F.H., & Janis, C.M., 2019. *Vertebrate Life*, 10th ed. New York: Oxford University Press. There is no required lab manual. Dissection guides and other resources will be available on Canvas and in lab. These materials MUST remain in lab for all to use.

Additional Resources:
Canvas: Lecture slides, videos, and worksheets will be made available on Canvas (https://canvas.geneseo.edu). Additional resources such as helpful reading, relevant articles, and sample test questions may also be posted.

Laboratory materials: In labs with preserved specimens, you will need eye protection, and you may optionally want a lab coat. In such labs, you cannot wear open-toed shoes at all, and cannot wear shorts without a lab coat. You will want a binder or folder to keep lab handouts in. All other lab materials are provided.

Course Goals:
By the end of the course, students should be able to:
1. Make and interpret phylogenetic classifications (evolutionary relatedness) and explain in writing their significance in contemporary vertebrate biology.
2. Describe the evolutionary history of vertebrates supported by phylogenetic analysis and the fossil record and explain how these criteria support that history.
3. Analyze form-function relationships and recognize and explain examples of adaptation and constraint.
4. Demonstrate a strong understanding of the evidence for the occurrence of evolution and analyze critically examples of objections and misinformation.
5. Use scientific knowledge to interpret examples and experimental data and address real-life problems involving vertebrates.
6. Communicate knowledge of vertebrates in a variety of formats.

EVALUATION (SUMMARY):

Weekly Assignments (10 x 5 pts each)	50 pts
Lab Worksheets (11 x 5 pts each)	55 pts
Class presentation (1 x 50 pts)	50 pts
Lab Atlas (2 x 55 pts each)	110 pts
Wikipedia-style Article (1 x 100 pts)	100 pts
Exams (3x 100 pts)	300 pts
	665 pts

Weekly Assignments: Each week, there will an assignment or assignments totaling 5 points. The exact nature of the assignments will vary from week to week, and may include activities through Canvas, traditional homework, as well as in-class activities paired with pre-class videos.

In Lab Activities: The lab worksheets are assignments completed in the weekly lab, and are turned in at the end of the lab period. There are 11 of these, worth 5 pts. each.

Class presentation: The class presentation consists of groups giving a presentation on a vertebrate family. Please make sure that everyone is involved equally. If you feel there is some impediment to equal participation, please talk to me so I can remedy the situation. I expect that each student will be involved in the research, production, and presentation of each presentation. Each presentation should be about 15 minutes in length (remember that that each slide typically takes 30 sec to 1 min to present). Participation will be partly assessed by group self-evaluation, whereby you will each evaluate the participation of the other member in your group. Please practice your presentation ahead of time to be more eloquent and efficient with your presentation. I will be happy to look over your slides before your presentation to give you suggestions for improvements.

Lab Atlas: For this assignment, you will produce an atlas of comparative anatomy based on the materials in the lab. The atlas will include bolded terms from the labs (excluding the first two labs) illustrated and labeled. A key and guide materials are available on Canvas. The first atlas covers fish and amphibians, and the second covers amniotes.

Wikipedia-style article: Working in pairs, you will produce a Wikipedia-style article for a vertebrate species which is currently only represented by a “stub” or without a page. Using a combination of primary and secondary sources, you will expand what is written about the species covering such topics as appearance, reproduction, range, behavior, habitat, conservation, and any other applicable factors. Note that we will not be publishing the article on the web.

Exams: There will be three exams, each worth 100 points. The exams consist of multiple choice and short answer questions. Although each exam will emphasize the most recent material, the course content is naturally cumulative. As such, later exams will call for making connections to earlier material. Information from lab will be helpful in lecture and vice-versa, although lab material will not be explicitly tested in the exams.

Note: **No make-up exams** will be given unless a written confirmation of a valid excuse is provided. If you are feeling unwell or have some other type of emergency, please let me know ASAP by email or a phone message, and then we can arrange for a makeup.

Class attendance: Although class attendance is not graded per se, you must attend classes and labs in order to complete both in- and out-of-class assignments. Failure to come to class (or make arrangements ahead of time) will make it difficult to accomplish these assignments successfully. **However, do not come to class or lab with symptoms of COVID-19.** If you are feeling unwell on a day that class meets in-person, do not attend. Remember that it is better to stay home if you are not feeling well than to attend class and risk spreading illness to others. Throughout the semester, please be proactive in communicating about absences and contact the Dean of Students if you expect to be out for an extended period of time. Just email me and we will work out how to makeup what you miss.

Grades will be assigned according to the following scale:

A 93–100%	B+ 87–89%	C+ 77–79%	D 60–69%
A- 90–92%	B 83–86%	C 73–76%	E 0–59%
	B- 80–82%	C- 70–72%	

Accessibility:
SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility will coordinate reasonable accommodations for persons with physical, emotional, or cognitive disabilities to ensure equal access to academic programs, activities, and services at Geneseo. Students with letters of accommodation should submit a letter to each faculty member and discuss their needs at the beginning of each semester. Ror questions related to access and accommodations, please contact the Office of Accessibility Services in Erwin Hall 22, access@geneseo.edu, or 585-245-5112. Additional information on the Office of Accessibility is available at https://www.geneseo.edu/accessibility-office.

Academic Integrity and Plagiarism:
Academic dishonesty includes cheating, knowingly providing false information, plagiarizing, and any other form of academic misrepresentation. College policies and procedures regarding academic dishonesty are available at www.geneseo.edu/handbook/academic-dishonesty-policy.

Health and Well-being:
The changes brought on by COVID-19 have impacted us all in a number of ways, and will continue to do so at various times and to varying degrees during the upcoming semester. Your health and well-being are foundational to your ability to learn, and if you find that you are feeling unwell (physically or mentally) and it is impacting your ability to complete your coursework, please reach out. Concerns about academic performance, health situations, family health and wellness (including the loss of a loved one), interpersonal relationships and commitments, and other factors can contribute to stress. Students are strongly encouraged to communicate their needs to faculty and staff and seek support if they are experiencing unmanageable stress or are having difficulties with daily functioning. The Dean of Students (585-245-5706) can assist and provide direction to appropriate campus resources. For more information, see www.geneseo.edu/dean_students.

Schedule:

DATE			LECTURE	READING
Aug	30	M	Intro to vertebrate diversity	Chapter 1.1
Sep	1	W	Phylogenetics	Chapter 1.2–1.4
	3	F	Paleontology	Chapter 1.5
	6	M	**Labor Day**—No class	
	8	W	Chordates	Chapter 2.1–2.2
	10	F	Vertebrate Origins	Chapter 2.3–2.6, 3.1–3.2
	13	M	Agnathans	Chapter 3.1–3.3
	15	W	Evolution of jaws	Chapter 3.4–3.6
	17	F	Early Gnathostomes / Chondrichthyes I	Chapters 3.7, 6, 7.1, 7.4
	20	M	Chondrichthyes II	Chapter 4.2, 6 & 7
	22	W	Osteichthyes / Actinopterygii I	Chapter 8.1–8.2, 9.1
	24	F	Actinopterygii II video—in class activity	Chapter 4.1, 9.2–9.4
	27	M	Sarcopterygii	Chapter 8.3, 9.7
	29	W	Review	
Oct	1	F	**Exam 1**	
	4	M	Transition to land	Chapter 10.1–10.2, 12
	6	W	Early Tetrapods	Chapter 9
	8	F	Lissamphibia I	Chapter 10.3, 12
	11	M	**Fall Break**—No Class	
	13	W	Lissamphibia II	Chapter 11.1
	15	F	Amniotes / Life on land	Chapter 11.2–11.6
	18	M	Synapsida	Chapter 10.4
	20	W	Mammals I	Chapter 25.1–25.3
	22	F	Mammals II	Chapter 25.4–25.6
	25	M	Primates to Humans	Chapter 26.1–26.6

DATE			LECTURE	READING
	27	W	Lepidosauria I	Chapter 17.1–17.2, 17.4
	29	F	Lepidosauria II	Chapter 17.3, 17.6–17.10
Nov	1	M	Life without Limbs (Snakes, lizards, caecilians)	Chapter 17.1, 17.5
	3	W	Review	
	5	F	**Exam 2**	
	8	M	Archosaurs I (Crocodylians)	Chapter 18
	10	W	Archosaurs II (Pterosaurs)	Chapter 19.2, 19.5
	12	F	Archosaurs III (Dinosaurs)	Chapter 19.1, 19.6–19.10
	15	M	Endothermy vs Ectothermy	Chapters 9.6, 12.7, 15, 19.11, 20
	17	W	Birds I	Chapter 21, 22.1
	19	F	Birds II	Chapter 22.3–22.11
	22	M	Flight Lecture Video—In class activity	Chapter 21.2, 22.1–22.2
	24	W	**Thanksgiving**—No class	
	26	F	**Thanksgiving**—No class	
	29	M	Sauropterygia	Chapter 19.3
Dec	1	W	Turtles I	Chapter 16.1
	3	F	Turtles II	Chapter 16.2–16.5
	6	M	Feeding	
	8	W	Life Underground	
	10	F	Mass extinctions	Ch. 5.5, 13.5, 23.5, Ch. 26.7
	13	M	Review	
	15	W	Final Exam – 12 PM	

Lab Schedule:

DATE	TOPIC
Aug 31	Intro to Vertebrate Morphology
Sep 7	Phylogenetics
Sep 14	Lamprey & Jaws
Sep 21	Chondrichthyes
Sep 28	Osteichthyes
Oct 5	Amphibians
Oct 12	**Fall Break**—No Lab
Oct 19	Work on Atlas I
Oct 26	Mammals
Nov 2	Lepidosaurs
Nov 9	Archosaurs
Nov 16	Birds
Nov 23	Presentations
Nov 30	Testudines
Dec 7	Work on Atlas 2