

**UNIVERSITY OF REGINA - DEPARTMENT OF BIOLOGY**  
**BIOLOGY 385-001 - VERTEBRATE ANIMAL BIOLOGY**  
**Winter 2026**

**Territorial acknowledgement:** The University of Regina is situated on the territories of the nêhiyawak, Anihšīnāpēk, Dakota, Lakota, and Nakoda, and the homeland of the Métis/Michif Nation. The Regina campus is on Treaty 4 lands, and Saskatoon classes are on Treaty 6 lands.

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**Lectures:** MWF at 1230; CL 313

Lab: R at 14:30 in LB 425

**Office hours:** I typically do not keep formal office hours BUT when I am in, my door is open and I really encourage you to “disturb” me. I am a strong believer that you should NEVER be afraid or even timid about approaching me. Feel free to contact me by email and set up a specific time to meet. Please let me know if there is anything I can do to make the course more accessible, or if there is anything that it is useful for me to know about your learning style or life circumstances which may affect your performance (I don’t want to be nosy – but a heads up is useful and maybe I can help!). The course will be challenging, but the structure of the course itself should not be a barrier to your learning.

**Accommodations:** Students who may need specialized accommodations should contact the Centre for Student Accessibility (Riddell Centre 229; 306-585-4491) and discuss these accommodations with us.

**Attendance policy:** Attendance at lectures and in the labs is expected.

**Academic integrity:** Academic integrity requires students be honest. Assignments and exams are to help students learn; grades show how fully this goal is attained. Thus, all work and grades should result from and thus reflect a student’s own understanding and effort.

Acts of academic misconduct violate academic integrity and are considered serious offences by the University. Examples include, but are not limited to, cheating on tests or exams, plagiarizing, copying from others, using AI to write for you, falsifying lab results, etc. Instances of academic misconduct will be reported to the Associate Dean Academic for investigation. Full details are provided in the [Undergraduate academic calendar](#). Students need to understand your obligations as a student, as well as your rights. My goal is to teach you a lot, I need your help and effort to do that.

**Text:** Pough, Bemis, McGuire & Janis. 2023. *Vertebrate Life*, 11th edition, Oxford Univ. Press. I strongly recommend that you have access to this OR a previous edition. Frankly I like the 10<sup>th</sup> edition better.

**Overview:** This course will explore aspects of the anatomy, ecology, distribution, and phylogeny of vertebrates. The overall scope will include evolution; some taxonomy, physiology, and reference will be made to other members of the Chordates. I feel that much of the material is best approached from a historical context; therefore, anatomy will be studied from a phylogenetic perspective, and the diversity and evolution of extinct vertebrates will also be considered. There is no possible way to "cover" all there is to know about Vertebrates in the time we have. The text is an excellent treatment of the information

and written in a manner that makes the reading enjoyable. It will cost you over **10 cents per page to buy**, get your money's worth and read it!

**Lectures:** The lectures will be given in person, but I don't want anyone to come if they are ill. All I ask for it's a heads-up email – even an hour before and I will Zoom the lecture as well. At the same time, if you are well, I do expect you to attend in person. I will not record them. To begin, I will cover a variety of topics that apply to all vertebrates including: the basic body plan and key characteristics, evolution and natural selection, origin of ancestral vertebrates, relationships with other chordates, classification and taxonomy, phylogenetic methodology, relevant geological concepts and the nature of the fossil record.

Subsequent lectures will cover vertebrate sub-groups. In each case, I will discuss the evolutionary history and development of key innovations followed by selected topics about the biology of extant members (morphology, physiology, and ecology). Inferences regarding the biology of extinct groups based living taxa will be considered. Supplemental reading will be assigned as required. There will be a mid-term during class on **Friday 27 February**, which will cover the material to the end of lecture on **Wednesday 25 February**.

**Term Paper:** The term paper should be approximately 2800-3300 words in length (10-12 double-spaced pages of text). You will not be penalized if it is only 9 pages or stretches to 14. I am looking for it to be of the appropriate length to “address” the topic. Your paper can address any specific aspect of Vertebrate Zoology of your choice. A number of suggested subject areas are listed below (but you may choose any topic that we agree on). You will submit a one-page outline with 2-3 primary references on **Wednesday 24 January**. This will show you have done some thinking about a topic and allow me to minimize the chance that the topic you choose is too broad, too narrow or unrealistic to write a good paper. I strongly recommend a topic allowing you to weigh evidence for and against an idea or hypothesis and come to a conclusion rather than just writing something descriptive.

The information in your paper will be more detailed than in either the lectures or the text. The purpose of the paper is for you to synthesize information from the PRIMARY LITERATURE (that contained in specialized journals and edited symposium volumes). Most web sites and semi-popular journals are NOT primary literature although you can find “open access” peer-reviewed journal articles via the web). I want you to evaluate a hypothesis(s) or assess a current debate. In your synthesis, I expect, welcome and indeed will reward your opinion, with the understanding that it is supported by data and evidence from the literature (where available) or logic you develop in the text of your paper.

Another purpose of the paper is to teach you how real scientific writing takes place. This means that your paper will go through a review process by both a classmate and me. After the reviews, you will be given time to revise your paper. This exercise is designed to improve your writing skills as well as learning about a specific topic in zoology.

**Due Dates:**     **One page outline – Wednesday 21 January**  
**First draft – Friday 13 February** - Although this is a first draft, prepare it as if it's the only version you submit. There is a 10% per day lateness penalty.  
**Verbal overview:** Prior to giving your seminar I intend to have a 5-10 “Chat” with each of you to ensure that you really understand the goal and intent of your paper. I will leave it to you to schedule this with me at a time of mutual convenience. There are no grades associated with this conversation.  
**Final draft – Monday 23 March.**

You are free to use whatever format you wish, as long as your product is logically organized and coherent. The textbook will likely serve as a beginning source of papers for your work. You may use

illustrations (which are not part of the 10-12 pages) if you feel they are appropriate, but these are not required. **Do not** use direct quotations. This is your paper and should not be a series of quotations strung together. Evaluate the material you are discussing; I welcome and will reward logically argued interpretations of the information. Papers will likely be similar to those you would find in Journals such as "Quarterly Review of Biology" and "Annual Review of Ecology, Evolution and Systematics". Before you start, I suggest you read some articles from these Journals to get a feel for this type of paper.

Cite your references following the format of the Canadian Journal of Zoology. In the text: e.g., "Jones (1988) found that whales can't dance" or "sheep are woolly (Smith, 1976)". Do not use footnotes; they are not typical of scientific writing. Only those references actually referred to in the text, are listed.

Many journals in the library contain reports that may be applicable (and could be browsed for possible topics). Examples: American Naturalist, Biological Reviews, Journal of Zoology (London), Canadian Journal of Zoology, Journal of Morphology, Canadian Journal of Fisheries and Aquatic Sciences, Journal of Herpetology (amphibians, reptiles), Auk, Condor, Ibis (dicky birds), Journal of Mammalogy (furry beasts), win a slice of pizza at Trifons by going to my lab and telling grad student Zach Eltom "I am a Biol 385 student and ice-fishing is stupid", Wildlife Monographs, Journal of Paleontology, Palaeontology, Evolution, Journal of Animal Ecology, Nature and Science

**Seminars:** Each of you will present a short (10 min + 2 min for questions) seminar to the class. These seminars will take place in lecture and lab periods (In lab on March 5 and class as needed on March 6), after the first draft of your essay has been submitted. I expect you to use audio-visual aids to illustrate your talk (e.g., PowerPoint). I expect participation from the rest of the class in the form of attendance and relevant questions, and the general thrust of the material presented will be fair game on exams. You will have done a lot of work in researching and writing your essay. Class members should benefit from all of your efforts and the knowledge that you have acquired.

**Topics:** I encourage you to investigate any topic that interests you, but possible topics include:

- the origin, biogeography or extinction of a particular group (tetrapods, birds, etc)
- the origin of jaws, fins, organ systems, ecological adaptations etc.
- comparison of adaptations for flight - birds, bats, pterosaurs
- relationship between diet and dentition in mammals
- homeothermy in "lower" vertebrates
- return of amniotes to an aqueous environment (e.g., morphology, physiology)
- phylogenetic relationships within a particular group

**Laboratory:** The weekly laboratory will begin **Thursday January 15** (second week of classes) and will emphasize comparative vertebrate anatomy, diversity, phylogeny, means of identification, and taxonomy. There is a lab safety test that must be done prior to the first lab, and the lab will have a midterm and final (see UR Courses).

**Evaluation:**

Midterm	8%
Term Paper - Outline	1%
- First Draft	8%
- Review of another student's paper	3%
- Final Draft	15%
Seminar	5%
Laboratory	35%
Final Lecture Exam	<u>25%</u>
	100%