Evolution of Vertebrates (Biology 3219)

Course description:

Survey of vertebrate animals with an evolutionary and paleontological perspective on adaptive features. Lab sessions examine morphological, anatomical, and behavioural characteristics, with special reference to comparative locomotory, feeding, and reproductive strategies.

Professor: Dr. Janice M. Hughes
Office: CB 4052

Contact information: Email: janice.hughes@lakeheadu.ca

Please note: I attend to my email regularly from Monday to Friday during the academic year so I will typically respond to your messages on a same day basis during the week. However, I may not open emails that have been sent from accounts other than your university account (e.g., hotmail) so use your *lakeheadu.ca* email for all of your messages.

Office hours:

Office hours through Zoom are available by appointment. I will also be offering one to two office hours on most weeks during the term through Zoom. Please see the schedule below.

Learner goals:

Upon satisfactory completion of this course, the student will be able to:

1. Describe the origins and evolution of vertebrate taxa, and identify their relationships to their closest living and nonliving relatives.
2. Articulate current views of vertebrate systematics, conservation, and biodiversity.
3. Describe how many novel innovations evolved in vertebrates, and how this contributed to the diversity of extant vertebrate life.
4. Discuss how vertebrate taxa are adapted to feed, reproduce, and move from place to place.
5. Describe aspects of functional anatomy and behavior in vertebrates, and explain how it is adaptive.
6. Articulate the mechanisms associated with mass extinctions, and describe how they changed the biotic and abiotic profiles of Earth.
7. Appreciate and practice the handling of vertebrate specimens for scientific research and educational purposes.
8. Predict aspects of the natural history of vertebrates from observations of their morphology.

Lectures:

1. All lectures will be delivered remotely at the scheduled time (see Lakehead Timetable). Attendance is highly recommended. Lecture notes will not be provided, and the PDFs of slides only show a brief outline of the course material. The things that I say in class are important!

2. There is no textbook; however, extensive resources are available on the D2L course website, including PDF of lecture slides, glossaries, videos, and on-line study aids.

3. There are two online lecture tests worth 25% each. They will occur during regular class time, and are not cumulative. There is no final exam during the April final exam period. Please remember that you must do these online tests alone (no help or collaboration!). Collaboration on tests is considered cheating. Also, cutting and pasting, copying, or downloading answers from another source (e.g., Wikipedia) is considered plagiarism. The minimum penalty for plagiarism or collaboration on the tests will be a mark of zero on the test. You can find more information on the D2L course webpage.

4. If you miss a test due to illness or other valid reason, you must inform me by email within 24 hours of the scheduled test time; otherwise, you will not be able to write a make-up test.

Labs:

1. All lab material (including the lab manual) will be posted to D2L, and will provide practical components of the course to support the topics covered in lectures. There are no scheduled labs but you will be responsible for all material found in the lab manual and posted in the supplementary lab materials on D2L.

2. There are three online lab quizzes that will occur during the scheduled lab time. Lab quizzes begin promptly at 2:30. You will not be able to write the lab quizzes at other times, and any questions answered after the quizzes close will not be marked. More information regarding these quizzes will be provided in class.

Assignments:

1. An information sheet regarding the fossil species account project is available on D2L. Please remember that you must select species that are extinct and only known from the fossil record. Fossil species accounts must be submitted as a PDF file to the D2L dropbox. More information will be provided in class. This work must be referenced! Any form of plagiarism (e.g., copying, cutting-and-pasting, paraphrasing without referencing) will result in a grade of zero. I will be checking so be forewarned! If you are unsure as to what constitutes plagiarism, please make an appointment with me so that we can discuss it. Late accounts will be accepted; however, 1.5% (out of the total 15%) will be deducted for each day the assignment is late.

2. There are two assignments worth 2.5% each based on videos posted to D2L. For each assignment, you will be required to watch a video and complete a worksheet. More information about these assignments will be provided in class and on D2L.

Additional information:

1. I am committed to providing a learning environment that will give all students the best possible chance of success in this course. Please come and see me during office hours (or by appointment), or talk to me in class or lab, if I can be of assistance.

2. For students registered with Student Accessibility Services, I can offer many solutions for your recommended accommodations. Please make an appointment and we can discuss these options.

3. Please note that I have a zero-tolerance policy on cheating and plagiarism. The minimum penalty for cheating or plagiarism will be a mark of zero on the test or assignment, and a report may be sent to the Dean and kept on file at the Office of Student Affairs. Not reading this is not an excuse for not knowing it!

Grading scheme:

Midterm test	March 2	25%
Final test	April 1	25%
Lab quiz 1	February 10	10%
Lab quiz 2	March 10	10%
Lab quiz 3	April 7	10%
Assignment 1	February 18	2.5%
Assignment 2	March 16	2.5%
Fossil species accounts	April 8	15%

Lecture Topic Outline

January 12	Unit 1	Introduction/Vertebrate Diversity
January 14	Unit 1/2	Classification/Chordate bauplan
January 19	Unit 2	Vertebrate bauplan
January 21	Unit 3	Early vertebrates and agnathans
January 26	Unit 4	Gnathostome bauplan; Life in water
January 28	Unit 5	Early gnathostomes
February 2	Unit 6	Chondrichthyans
February 4	Unit 7	Major radiation of fishes: Osteichthyans
February 9	Unit 8	Tetrapod origins and the invasion of land
February 11	Unit 9	Extant amphibians: Lissamphibians
February 16/18		**Study week**
February 23	Unit 10	Evolution of amniotes; Anapsids
February 25	Unit 11	Lepidosaurs
March 2		**Midterm test (Units 1-9)**
March 4	Unit 12	Mesozoic archosaurs/Crocodilians
March 9		
March 11	Unit 13	Evolution of birds
March 16	Unit 14	Avian flight
March 18	Unit 15	Avian ecology and behaviour
March 23	Unit 16	Rise of mammals
March 25	Unit 17	Monotremes and marsupials
March 30	Unit 18	Eutherians
April 1		**Final test (Units 10-18)**
April 6/April 8		**No lectures**

Laboratory Topic Outline

January 13	Office hours on Zoom (2:30-3:30)
January 20	Office hours on Zoom (2:30-3:30)
January 27	Office hours on Zoom (2:30-3:30)
February 3	Office hours on Zoom (2:30-3:30)
February 10	**Lab Quiz 1 (Lab 1)**
February 17	**Study Week**
February 24	Office hours on Zoom (2:30-3:30)
March 3	Office hours on Zoom (2:30-3:30)
March 10	**Lab Quiz 2 (Labs 2 and 3)**
March 17	Office hours on Zoom (2:30-3:30)
March 24	Office hours on Zoom (2:30-3:30)
March 31	Office hours on Zoom (2:30-3:30)
April 7	**Lab Quiz 3 (Labs 4 and 5)**