

This syllabus is a general representation of the course as previously offered and is subject to change.

BIOL 204 – Vertebrate Structure and Function

General Course Syllabus (as of January 2020)

About the Course:

Course Description: This course uses both lectures and labs to investigate vertebrate anatomy, development, and evolution with a comparative approach, examining the relationship between structure and function in different vertebrate taxa.

Course Format: Lecture and Laboratory

Credits: 4

Prerequisites: BIOL 121 (or Science One) and BIOL 140; or 8 transfer credits of first-year biology

Course Learning Objectives:

By the end of this course, students should be able to:

- Compare and contrast the anatomy of each of the major vertebrate taxa
- Evaluate the classification of a mystery vertebrate, given information on its anatomy and/or development
- Analyze how anatomical differences affect function
- Predict whether structures in different vertebrate taxa are homologous based on the embryonic origins of these structures
- Identify the major characters that arose during the evolutionary history of vertebrates and indicate these characters on a phylogenetic tree
- Work together with a group to dissect three representative vertebrates and identify major structures

Textbooks and Additional Resources:

- **Textbook** (recommended but not required): "Vertebrates: Comparative Anatomy, Function, Evolution," 8th Edition, By Kenneth Kardong (McGraw Hill Publishers)
 - The seventh, sixth, or fifth editions are all acceptable, while the fourth and earlier editions are out of date and so are not recommended.
- **iClicker:** available from the UBC Bookstore
- **Laboratory Guide:** details on where to purchase the manual will be announced during lecture (approximately \$30).
- **Dissection kit:** available from the UBC Bookstore; required for Labs 5-10. May be shared between two people who are in the same lab section (dissection partners).
- **Safety glasses:** available from the UBC Bookstore.
- **Coloured pens or pencils** for colour-coding diagrams in lab (yellow, red, blue, and green are required)
- **Course website on Canvas:** canvas.ubc.ca

Evaluation:

| Assessment | Weight |
|--------------------------------------|-------------|
| Lectures (60% of total grade) | |
| • Midterm Lecture Exam | 18% |
| • Final Lecture Exam | 35% |
| • Clicker Questions Participation | 4% |
| • Lecture Review Assignments | 3% |
| Labs (40% of total grade) | |
| • Midterm Lab Exam | 14% |
| • Final Lab Exam | 20% |
| • Lab Participation and Cleanup | 2% |
| • Group quizzes | 2% |
| • Pre-reading quizzes | 2% |
| Total | 100% |

CLICKER QUESTIONS:

During lectures, students will often break up into small groups to solve problems. Students will need to bring their iClicker to class to answer these questions. Marks are provided for participation. Unlike the clicker questions, lecture midterm and final exam questions will not be multiple choice – for most clicker questions, a “Possible Exam Wording” will be provided on Canvas to give students examples of how these questions would appear on an exam.

LECTURE REVIEW ASSIGNMENTS:

Lecture Review Assignments will be provided on Canvas at the end of each unit – these multiple-choice questions are generally not the type of questions that will appear on exams, but are meant as an opportunity for students to review the course material and gain feedback on their basic understanding of this material.

STUDY QUESTIONS:

After completing each major topic in lecture, study questions will be posted on Canvas. These questions will not be graded, but are meant to help students test their understanding of the course material and to give the opportunity to practice answering exam-style questions.

LAB PRE-READING QUIZZES:

It is very important to prepare for each lab by reading the relevant pages in the lab manual beforehand. To help students review this pre-reading, there will be a short online assignment on Canvas that is due before each of the labs.

LAB PARTICIPATION/CLEANUP MARK:

Participation marks are awarded during each lab period for completing all of the activities and discussion questions, for keeping the lab clean and safe, and for careful and accurate completion of all dissections.

LAB DISSECTIONS:

During the dissection labs, students will work in groups to dissect three different preserved specimens from representative taxa. Students are expected to prepare beforehand to familiarize themselves with the terminology and anatomy. Most of the time in the dissection labs will be spent working closely within each group to identify structures, investigate the relationship between structure and function, and compare the different animals.

LAB GROUP QUIZZES:

During three of the labs, a group quiz will test understanding of the anatomy, function and development of structures in the lab specimens. These quizzes are meant to be a relatively low-stress opportunity to practice for the lab exams and to obtain feedback on progress in the lab.

Course Policies:

Academic Integrity: Students are welcome to work together on homework assignments and clicker questions but all exams (both lecture and lab) must be taken individually. The University policies on cheating and plagiarism will be strictly enforced (<http://www.calendar.ubc.ca/vancouver/?tree=3,54,111,959>).

Missed Coursework, Labs, or Exams:

Because of time constraints, there will not be makeup exams for the lecture midterm. Students must contact the lecture instructor as soon as possible if they miss the lecture midterm. If a lecture midterm is missed due to circumstances that constitute grounds for academic concession (such as an emergency or illness), the final exam may be reweighted to count as 53% of the final course grade. If appropriate, the lecture instructor will request a completed Student Declaration of Academic Concession form in order to consider the eligibility of this request.

Students must contact the lab instructor as soon as possible if they miss a lab exam. If a lecture midterm is missed due to circumstances that constitute grounds for academic concession (such as an emergency or illness), a student may write that lab exam during another regularly scheduled lab exam time that week (as scheduled by the lab instructor based on available space), or if that is not possible, the lab instructor will provide a makeup lab exam using photographs rather than physical specimens. If appropriate, the lab instructor will request a completed Student Declaration of Academic Concession form in order to consider the eligibility of this request.

Missing three lecture classes (or forgetting your iClicker three times) will not impact the clicker question participation grade. However, students who miss more than three classes (or forget their iClicker more than three times) must contact the lecture instructor to explain the reason for their absence. If appropriate, the lecture instructor will request a completed Student Declaration of Academic Concession form in order to consider the eligibility of this request.

Students who are absent from lecture or lab (or who arrive late to lecture or lab) are still responsible for the missed material. In the case of missed lecture material, it is the student's responsibility to find out from their classmates what material they have missed. In the case of a missed lab, the student should contact the lab instructor to seek permission to attend another regularly scheduled lab that week, or if that is not possible, to make up the missed lab during an open-lab time.

Schedule of Topics:

Note: This schedule is an estimate and so is subject to change.

| Week | Lecture | Lab |
|-------------|---|---|
| 1 | - Introduction, Embryology | No labs |
| 2 | - Embryology - Embryology, Morphological Concepts | Lab 1: Vertebrate Development |
| 3 | - Introduction to Phylogeny - Chordate Characteristics and Phylogeny | Lab 2: Introduction to Phylogeny |
| 4 | - Vertebrate Phylogeny and Evolution - Skull | Lab 3: Vertebrate Skulls |
| 5 | - Skull - Skull | Lab 4: Axial and Appendicular Skeleton |
| 6 | - Axial Skeleton - Axial and Appendicular Skeleton | Lab 5: Integument |
| 7 | - Integument - Integument | Lab Midterm Exam |
| | Reading Week – No Lectures | Reading Week – No Labs |
| 8 | - Muscles and Review - Midterm Exam (during usual class time) | Lab 6: Form and Function of the Muscular System |
| 9 | - Muscles - Digestive System | Lab 7: The Digestive and Urogenital Systems |
| 10 | - Digestive System and Respiratory System - Respiratory System | Lab 8: The Respiratory and Circulatory Systems |
| 11 | - Respiratory System - Circulatory System | Lab 9: The Nervous System |
| 12 | - Circulatory System - Nervous System | Lab 10: Review |
| 13 | - Urinary System - Reproductive System and Review | Lab Final Exam |
| Final Exam | Final Exam – TBA | |

University Policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.

UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.

UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.

UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on [the UBC Senate website](#).