



COURSE OUTLINE

1. **Course:** ZOOL 515, Comparative Vertebrate Anatomy - Winter 2019

Lecture 01: MWF 09:00 - 09:50 in ES 443

Instructor	Email	Phone	Office	Hours
Jessica Theodor	jtheodor@ucalgary.ca	403 210-9819	BI 353	W 10 am - 12 pm or by appointment.

Lab section(s): B01 T 09:00-12:00 in BI 044, B02 R 09:00-12:00 in BI 044

Course Technician: Mr. W. Fitch, fitch@ucalgary.ca, 403 220-5269, BI 037

Course Site:

D2L: ZOOL 515 L01-(Winter 2019)-Comparative Vertebrate Anatomy

Note: Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

Zoology 379 or 403.

Antirequisite(s):

Credit for Zoology 515 and 377 will not be allowed.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Midterm Lecture Exam #1	15%	In-Class Feb. 8
Midterm Lecture Exam #2	15%	In-Class March 22
Midterm Lab Exam	15%	
Graded dissection (group project)	10%	
Final Lab Exam	20%	
Final Lecture Exam	25%	

Both final exams will be scheduled by the Registrar's Office.

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	90 %	85 %	80 %	77%	73%	70 %	67 %	63%	60%	55 %	50 %

This course has a registrar scheduled final exam.

4. **Missed Components Of Term Work:**

In the event that a student misses the midterm or any course work due to illness, supporting documentation, such as a medical note or a statutory declaration will be required (see [Section N.1](#); for more information regarding the use of statutory declaration/medical notes, see [FAQ](#)). Absences must be reported within 48 hrs.

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize themselves with these regulations. See also [Section E.3](#) of the University Calendar.

5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

6. **Course Materials:**

Required Textbook(s):

Kardong, Kenneth V., *Vertebrates: Comparative Anatomy, Function, Evolution*. McGraw Hill.

Recommended Textbook(s):

Pough, F. Harvey and Christine Janis, *Vertebrate Life*: Sinauer/Oxford.

Lab instructions will be available from D2L and should be read in advance of lab each week.

7. **Examination Policy:**

No aids are allowed on tests or examinations.

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also [Section E.2](#) of the University Calendar.

10. **Human & Living Organism Studies Statements:**

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

Students are expected to be familiar with [Section SC.4.1](#) of the University Calendar.

11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:**The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at [403-220-2208](tel:403-220-2208) .
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email addy@ucalgary.ca or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See

[Section E.4](#) of the University Calendar.

- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](#) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](#) Email: suypaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](#) Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suypaca@ucalgary.ca.
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- l. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

ZOOLOGY 515 - Winter 2018 Lecture Schedule

Jan	F	11	Course introduction		No lab this week
	M	14	Phylogenetics and inference		
	W	16	Vertebrate body plan		
	F	18	Axial and appendicular skeleton		
	Lab			Intro, lamprey anatomy, shark/perch skeleton	Lab 1
	M	21	—		
	W	23	—		
	F	25	Appendicular skeleton and skull		
	Lab		—	Tetrapod skeletons	Lab 2
	M	28	—		
	W	30	—		
Feb	F	01	Skull		
	Lab		—	Fish musculature 1	Lab 3
	M	04	—		
	W	06	—		
	F	08	Midterm 1		

	Lab			Fish musculature 2	Lab 4
	M	11	Musculature		
	W	13	—		
	F	15	—		
	Lab			Tetrapod musculature 1	Lab 5
		17-24	Reading Break	No classes, no lab	
	M	25	Nervous system		
	W	27	—		
Mar	F	01	—		
	Lab			Tetrapod musculature 2	Lab 6
	M	04	—		
	W	06	—		
	F	08	—		
	Lab			Midterm lab exam in lab section	
	M	11	—		
	W	13	Digestive system		
	F	15	—		
	Lab			Fish sense organs and nervous system	Lab 7
	M	18	—		
	W	20	Respiratory system		
	F	22	Midterm 2		
	Lab			Fish digestive, respiratory and urogenital systems	Lab 8
	M	25	—		
	W	27	Urogenital System		
	F	29	—		
	Lab			Tetrapod digestive, respiratory and urogenital systems	Lab 9
Apr	M	01	—		
	W	03	Circulatory system		
	F	05	—		
	Lab			Fish circulatory system	Lab 10
	M	08	—		
	W	10	—		
	F	12	—		
	Lab			Tetrapod circulatory system	Lab 11

*** EVERYONE MUST WEAR SAFETY GOGGLES, GLOVES AND LAB COATS DURING DISSECTION LABS**

Please Note:

1. Refer to chapters 1-4, 18 and the Glossary throughout the course.
2. Follow up points of interest by using the "References" section at the end of each chapter of your textbook.

These laboratories are designed primarily to give you some idea of the range of structure and function of the major organ systems of vertebrates. In order to fully comprehend the implications of variation in structure it is necessary to constantly cross-refer to the text and lecture material and also to make use of specific demonstrations.

The laboratory should be the place where you observe the features discussed in lecture and where you develop the comparative approach. **Pay particular attention to function, homology, and developmental patterns.** Also, think of the organisms as if they were alive in their natural surroundings - only then will you be able to fully appreciate the particular structural attributes of a feature.

With respect to the laboratory workbook, it is imperative that you read the pages before coming to the lab. It is essential that you read all designated pages - the TA will clarify exactly what is to be achieved in each laboratory session at the beginning of the session. Please be in your lab seat with your specimen on the bench by the start of the lab. You will be at a disadvantage if you miss any part of the lab introduction given by the teaching assistant.

MID-TERM LAB EXAM

Week of Feb 4, 2019. The Mid-term lab exam will cover Labs 1-6.

FINAL LAB EXAM

Exam to be scheduled by Registrar. The lab final will cover Labs 7-11, and will build upon information carried over from Labs 1-6.

Lab Introduction

Laboratory work is a vitally important portion of this course. With the experience you will have gained in the analysis and recognition of anatomical form, you should at the end of the course be competent (with the aid of manuals or anatomical papers) to explore and comprehend the anatomy of any vertebrate. If you have learned that much, you will have gained from the course. It is not our intention, nor is it in our power, to teach you all the anatomy of all kinds of vertebrates; it is designed only to provide you with a basis for understanding vertebrate anatomy as you encounter it.

In order to accomplish this objective, however, it is necessary that you be at all times comparison-minded. The extent of the differences will on occasion baffle you, and you will demand an intermediate type to help you bridge the apparent gaps.

We will attempt to bridge these gaps for you in three ways:

1. by demonstrations of intermediate conditions in selected forms
2. by requiring you to read in parallel with your lab work the pertinent sections of the lecture text
3. by keeping the lecture portion of the course as far as possible in step with the lab

Plan of Work

The technique we have adopted for guiding you through the anatomies of the mink and the shark is that of "verification". The laboratory workbook describes or pictures for you the morphology of these animals. We expect you to ascertain for yourself the accuracy of these pictures and descriptions and to acquaint yourself with the actual structures in such a manner that you will be able to recognize them when you see them again.

Organize your time so as to complete the assigned work during the designated lab period. **You must prepare for each lab period by reading the lab workbook before you arrive in the lab.** You are urged to outline, prepare an abstract, underline, or prepare the portions of your workbook in any way that will facilitate your work during the brief lab period. Please note that the pages assigned delimit the "required" lab work, but realize that additional reading will prove helpful. In order to maximize the comparative aspect of the course, you will work in teams of 4, organized as two pairs. For each of the major organisms we will dissect, shark/perch and mink/rabbit, one pair will dissect each species. At the end of each dissection, you should then review your dissection with the other pair; so for the fishes, one pair will dissect the shark and the other the perch, and at the end of the lab demonstrate the anatomy you dissected with the other pair in your team, and they will do the same for you.

General Comments

1. There will be no smoking, eating or drinking in the laboratories.
2. The lab operates on an "open-ended" system You must always come to your scheduled laboratory period but, from past experience, you will probably need to come back during the week at some time to review your dissection. If you need additional lab time, you may contact the TA.

During regular lab hours those students scheduled at that time have priority on space and equipment and you must wait until they have all of their requirements before getting yourself organized. **IT IS IMPERATIVE THAT**

YOU KEEP THE LABORATORIES TIDY -WORKING PRIVILEGES OUTSIDE SCHEDULED LABORATORY HOURS WILL BE WITHDRAWN IF THE LABORATORIES BECOME INORDINATELY UNTIDY.

3. **You must provide yourself with a dissecting kit** and must realize that poor quality or poorly maintained instruments will result in poor dissections. Learn not to be afraid of touching the specimens and come quickly to the realization that your fingers are some of the best and most sensitive dissection instruments available. You must also provide your own eye protection.

4. **Get to know your lab TA and ask questions frequently.** Questions such as "Can you find 'x' for me?" will not be accommodated. The TAs are there to give you help and instruction and to clarify points but are not there to do all of the manual work for you. **Learn early to correlate the lectures and labs.** The lecture material only becomes meaningful when you have seen the real thing. Use the demonstrations as a bridge between the practical experiences of the laboratory and the theoretical approaches of the lecture.

SUMMARY

1. Labs missed because of illness must be made up by appointment with the Teaching Assistant. It is possible to attend a lab later in the week.

2. Specimens are not to be removed from the lab.

3. Each student is responsible for their own dissection material, work area, and demonstration material.

a) Dissection specimens must be labelled with your name and section, kept in good condition, and stored in the proper storage facility.

b) Work areas must be cleared, dissecting trays washed, and waste disposed of properly at the end of each period.

c) Demonstration material and other teaching material must be returned to the appropriate location at the end of each lab period.

4. There is no photography permitted in the lab. We encourage you to draw the specimens as needed.

Course Outcomes:

- Describe the anatomical systems of vertebrates and their interactions
- Explain the organismal function of anatomical systems
- Identify the anatomical structures of vertebrates
- Compare anatomical differences among major clades of vertebrates
- Explain the embryonic and evolutionary origin of anatomical structures
- Predict the 3 D relationships of structures based on 2D sections
- Communicate effectively orally and in writing using appropriate terminology

Department Approval:

Electronically Approved

Date: 2019-01-09 13:17