



# ZOO\*2090 Vertebrate Structure and Function

Fall 2022

Section(s): 01

Department of Integrative Biology

Credit Weight: 0.50

Version 2.00 - September 07, 2022

---

## 1 Course Details

### 1.1 Calendar Description

This course offers a comparative survey of the structure and functioning of the chordates with emphasis on the vertebrates and includes a laboratory study of the anatomy of selected vertebrates.

**Pre-Requisites:** 4.00 credits including BIOL\*1070

### 1.2 Course Description

This course is designed to expose students to the diversity of chordates and particularly the vertebrates. Structural variation among the vertebrates will be examined and linked to its functional significance and evolutionary history. The laboratory part of the course involves detailed anatomical study through dissection of selected vertebrates. By the end of this course, the student will be able to establish structure-function relationships of the body systems in different vertebrate groups.

### 1.3 Timetable

\*\*First lecture and laboratory sessions start Monday September 12, 2022

**LECTURES (in THRN 1200):** Monday/Wednesdays 11:30am - 12:20pm

**LABS (in SSC 2304):** Monday PM (2:30pm)/Tuesday AM (8:30am)/Tuesday PM (2:30pm)/Wednesday PM (2:30pm)/Thursday PM (2:30pm)

### 1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

---

## 2 Instructional Support

### 2.1 Instructional Support Team

<b>Instructor:</b>	Jinzhong Fu
<b>Email:</b>	jfu@uoguelph.ca
<b>Telephone:</b>	+1-519-824-4120 x52715
<b>Office:</b>	SC1 1458
<b>Office Hours:</b>	by appointment
<b>Lab Co-ordinator:</b>	Timothy Bartley
<b>Email:</b>	tbartley@uoguelph.ca
<b>Telephone:</b>	(519) 824-4120 x53676
<b>Office:</b>	SSC 2505
<b>Office Hours:</b>	By appointment, virtual via teams unless otherwise specified.

### 2.2 Teaching Assistants

<b>Teaching Assistant (GTA):</b>	Reilly O'Connor
<b>Email:</b>	zoo2090@uoguelph.ca
<b>Teaching Assistant (GTA):</b>	Cassandra Kotsopoulos
<b>Email:</b>	zoo2090@uoguelph.ca
<b>Teaching Assistant (GTA):</b>	Jacqueline Thomson
<b>Email:</b>	zoo2090@uoguelph.ca

## 3 Learning Resources

### 3.1 Required Resources

#### **Vertebrate Structure and Function: Lab activities (Lab Manual)**

ZOO\*2090 - Vertebrate Structure and Function Lab Manual (Digital Copy provided to all students on Courselink)

#### **Zoology Dissection Models (Equipment)**

Students will be provided with a Zoology Dissection Model kit during Lab 1 in SSC 2304 to help supplement our labs throughout the semester.

#### **Zoology Dissection Kit (Equipment)**

Available at the bookstore (\$21.95).

You will be using this kit in this course as well as future zoology courses.

Tools required: Dissecting Scissors (straight/sharp/blunt) 15 cm Dissecting Scissors (fine/straight) 11.5 cm Dressing Forceps (narrow/straight) 14 cm Splinter Forceps #5 (straight/long points) 11.5 cm Tissue Forceps (2x3 teeth) 15 cm Dissecting Probe (fine

point, 6mm) 15 cm Dissecting Needle (plastic handle/straight) Scalpel Handle #3  
#10 Scalpel Blades

## 3.2 Recommended Resources

### **Vertebrates: Comparative Anatomy, Function, Evolution (Textbook)**

Kardong, K.V. (2015) Vertebrates: Comparative Anatomy, Function, Evolution (7th ed.).  
McGraw Hill, New York. The earlier editions of this text are also acceptable.

Note: All of the material to be tested on the lecture exams will be discussed in class or labs  
so it is not necessary to acquire the textbook in order to do well in the course.

### **Lab Coat (Equipment)**

\*\*A lab coat is encouraged to be worn in labs but is not mandatory.

Lab Dress Code: Please wear pants and closed-toed shoes to labs (no  
shorts/skirts/dresses/sandals allowed).

## 3.3 Additional Resources

### **Encyclopedia of Life (Website)**

<http://www.eol.org/>

### **Animal Diversity Web (Website)**

<http://animaldiversity.ummz.umich.edu/>

### **Website devoted to The Devonian Period (Website)**

<https://www.devoniantimes.org>

---

# 4 Learning Outcomes

## 4.1 Course Learning Outcomes

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

1. Recognize the major groups of chordates, their origins, evolution, and morphological characteristics.
  2. Demonstrate an understanding of the principles of biological design.
  3. Demonstrate practical skills for identifying the morphological features of vertebrates.
-

## 5 Teaching and Learning Activities

**LECTURE FORMAT:** All lectures are in face-to-face format.

**LAB FORMAT:** All labs are in face-to-face format. Please note that lab activities are subject to change.

### 5.1 Lecture

**Topics:**

Note: the order and content of lectures is subject to change.

1. Origin of chordates
2. Overview of vertebrates
3. Diversity of fishes I
4. Diversity of fishes II
5. Integument of fishes
6. Skeleton of fishes I
7. Skeleton of fishes II
8. Respiration of fishes
9. Early tetrapods
10. Modern amphibians
11. Muscles
12. Early amniotes

13. Sauropsids I
14. Sauropsids II
15. Synapsids I
16. Synapsids II
17. Respiration and circulation
18. Digestive system
19. Urogenital system
20. Nervous system
21. Sense organs
22. Biological design
23. Special topic

## **5.2 Lab**

**Mon, Sep 12 - Thu, Sep 15**

**Topics:**

**Lab 1:** Introduction to ZOO\*2090 Labs and Early Chordates

**Mon, Sep 19 - Thu, Sep 22**

**Topics:**

**Lab 2:** Cartilaginous Fishes (Dogfish Shark)

**Mon, Sep 26 - Thu, Sep 29**

**Topics:**

**Lab 3:** Bony Fishes (Perch)

**Mon, Oct 3 - Thu, Oct 6**

**Topics:** **Lab 4:** Amphibians (Frog)

**Mon, Oct 10 - Thu, Oct 13**

**Topics:** **NO LABS** (Thanksgiving)

**Mon, Oct 17 - Thu, Oct 20**

**Topics:** **Sciensational Sssnakes!!** (Live animals)

**Mon, Oct 24 - Thu, Oct 27**

**Topics:** **Open Lab Period** (Lab Assignment Work-Study Period)

**Mon, Oct 31 - Thu, Nov 3**

**Topics:** **Lab 5:** Reptiles (Snake)

**Mon, Nov 7 - Thu, Nov 10**

**Topics:** **Lab 6:** Birds (Pigeon)

**Mon, Nov 14 - Thu, Nov 17**

**Topics:** **Lab 7:** Mammals (Rat)

**Mon, Nov 21 - Thu, Nov 24**

**Topics:** **Wild Ontario** (Live animals)

**Mon, Nov 28 - Thu, Dec 1**

**Topics:** **Open Lab Period** (Lab Assignment Work-Study Period)

---

## 6 Assessments

## 6.1 Assessment Details

### Lecture Midterm 1 (12.5%)

**Date:** Thu, Oct 6, online

Midterm will be released October 6 (9:00 AM) and closed on October 7 (11:59pm); Students will have 50-minutes to answer a selection of randomly assigned multiple choice and short answer questions using the quiz tool in Courselink.

Please note: Time and format is subject to change.

### Lecture Midterm 2 (12.5%)

**Date:** Thu, Nov 10, Online

Midterm will be released November 10 (9:00 AM) and closed on November 11 (11:59pm); Students will have 50-minutes to answer a selection of randomly assigned multiple choice and short answer questions using the quiz tool in Courselink.

Please note: Time and format is subject to change.

### Lecture Final (25%)

The final examination will be released during the time slot set by the registrar. Students will have 2 hours to answer a set of short answer questions or short essay questions. Students will be responsible for material from the entire course.

Please note: Time and format is subject to change.

### Lab Quizzes (15%)

There will be lab quizzes online every week throughout the semester to be completed individually based on the week's lab/lecture content. The best 5 of 7 quizzes will be marked. Each quiz will be worth 3% each, for a total of 15% of the lab mark.

**Online lab quizzes can only be completed during your regularly scheduled lab session to receive credit.**

Lab Quiz 1 - due Week of Sept. 12

Lab Quiz 2 - due Week of Sept. 19

Lab Quiz 3 - due Week of Sept. 26

Lab Quiz 4 - due Week of Oct. 3

Lab Quiz 5 - due Week of Oct. 31

Lab Quiz 6 - due Week of Nov. 7

Lab Quiz 7 - due Week of Nov. 14

**Lab Assignment I (15%)****Due:** Fri, Oct 28, 5:00 PM

Details on Lab Assignment 1 will be available through Courselink. Lab Assignment 1 will focus on content from Labs 1-4.

**Lab Assignment II (20%)****Due:** Fri, Dec 2, 5:00 PM

Details on Lab Assignment 2 will be available through CourseLink. Lab Assignment 2 will be a summative assessment of Labs 1-7.

## 6.2 Lab Manual Bonus Marks

A fillable PDF version of our lab manual will be provided to all students on Courselink at the beginning of our semester. Our lab manual is filled with schematic representations of the various vertebrate body systems to label as well as some pointed questions for students to answer using the information contained in the manual as well as from our online tutorials on Courselink.

Students who submit a complete lab manual by the end of the semester (the last day of classes at the latest) will be eligible to receive **2% bonus marks** for the semester. All figures must be complete and all questions answered in order to receive full bonus marks for the semester.

---

## 7 Course Statements

### 7.1 Use of Animals

This course uses preserved specimens from selected vertebrates for work in lab. Students must complete dissections of these specimens in order to complete lab assessments. The University is committed to principles of conducting research and teaching in accord with the highest ethical standards. Given that the use of animals, in research and teaching, is a critical aspect of the work of the University of Guelph, the Department of Integrative Biology is committed to minimizing the use, pain, and suffering of animals used for teaching and to ensuring that animals which are used will receive care and treatment that meets or exceeds the standards outlined by provincial guidelines and statutes, and by the Guidelines of the Canadian Council on Animal Care.

For more information:

[http://www.uoguelph.ca/research/assets/acs/docs/university\\_animal\\_care\\_policy\\_and\\_procedures.pdf](http://www.uoguelph.ca/research/assets/acs/docs/university_animal_care_policy_and_procedures.pdf)

### 7.2 Absence and Illness

If you cannot complete assignments for medical or other authorized reasons, please contact the instructors in advance of an assignment deadline to discuss the situation.



No medical documentation will be required but clear communication with the instructor well ahead of the deadline is expected.

### 7.3 Course Assessment Policy

Course assessment weighting is divided evenly between the Lecture (50%) and Lab (50%) components, with each component being tied to specific learning outcomes for our course. As such, it is the expectation that student needs to pass both the lab and the lecture components independently in order to pass this course.

### 7.4 Late Penalty on Assignments

The assignments will have a late penalty of 10% per day.

Thus, assignments that are **TEN (10) DAYS** late will receive 0%.

### 7.5 Online Behaviour (Netiquette)

**Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:**

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your user name and password
- Recording lectures without the permission of the instructor

## 8 Department of Integrative Biology Statements

## 8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

## 8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

## 8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.selfregulationskills.ca/>

## 8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University

officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.

(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

## 8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

# 9 University Statements

## 9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

## 9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

## 9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

## 9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

## 9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website  
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website  
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

## 9.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not

relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

## 9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## 9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

## 9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

## 9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

## 9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

---