



## COURSE OUTLINE

### 1. **Course:** ZOOL 461, Animal Physiology I - Fall 2022

Lecture 01 : MWF 09:00 - 09:50 in SB 103

Instructor	Email	Phone	Office	Hours
Dr Corey Flynn	cflynn@ucalgary.ca	403 220-5055	BI 448	By Appointment Only
Dr. Kelsey Lucas	kelsey.lucas@ucalgary.ca	403 220-7202	BI 286B	TBA
Dr Matt Vijayan	matt.vijayan@ucalgary.ca	403 220-3094	BI 268	By Appointment Only

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

#### **In Person Delivery Details:**

The lectures for this course will take place in-person.

#### **Re-Entry Protocol for Labs and Classrooms:**

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found [here](#). **Online Delivery Details:**

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, synchronous final exam. The writing time is 1.5 hours + 50% buffer time.

All Exams will be administered online through D2L and will be 90 minutes. Midterm exams (Sept 28, Nov 2, Nov 28) will be written in the evening (7:00pm - 8:30pm). The Final Exam will also be administered online through D2L and will be during the Registrar-scheduled final exam period. The date/time of the final exam will be announced once the Registrar schedule is released.

#### **Course Site:**

D2L: ZOOL 461 L01-(Fall 2022)-Animal Physiology I

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

#### **Equity Diversity & Inclusion:**

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

The Biological Sciences Equity Committee acknowledges there are persistent barriers that prevent such accessibility and hinder our progress towards EDI. Our representatives (faculty, staff, postdocs, graduate and undergraduate students) are committed to addressing any concerns and work towards proactive solutions that enact necessary change within the department. To submit anonymous questions, comments or concerns regarding EDI related issues, please reach out to our Chair, Constance Finney ([constance.finney@ucalgary.ca](mailto:constance.finney@ucalgary.ca)), or a committee representative of your choice at <https://science.ucalgary.ca/biological-sciences/about/equity->

2. **Requisites:**

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

**Prerequisite(s):**

Biology 331.

**Antirequisite(s):**

Credit for Zoology 461 and any of Biology 305, Medical Science 404, 604, Zoology 269, Kinesiology 259, 260 or 323 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:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Labs <sup>1</sup>	24%	Ongoing		
Midterm 1	16%	Sep 28 2022 at 07:00 pm (90 Minutes)	online	D2L
Midterm 2	29%	Nov 02 2022 at 07:00 pm (120 Minutes)	online	D2L
Midterm 3	15%	Nov 28 2022 at 07:00 pm (90 Minutes)	online	D2L
Registrar Scheduled Final Exam	16%	Will be available when the final exam schedule is released by the Registrar	online	Will be available when the final exam schedule is released by the Registrar

<sup>1</sup> There will be 5 lab reports and one lab quiz. Each of these 6 components is worth 4% of the final grade. Therefore, the lab is worth 6X4=24% total.

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	95 %	90 %	85 %	80%	75%	71 %	67 %	63%	59%	55 %	50 %

This course will have a Registrar Scheduled Final exam that will be delivered on-line. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 1.5 hours.

Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. Due to the scheduling of the final exams, the additional time will be added to **the end** of the registrar scheduled **synchronous** exam to support students. This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm.

You must obtain a passing grade (D minimum) in the lecture component of the course (weighted average of the midterms and final exam) to be considered for a passing grade overall in the course. Students who do not obtain at least a D in the lecture component of the course will receive an F as their final grade in the course, regardless of their lab grades.

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

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

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

There are no makeup midterm exams. If a student misses a midterm exam due to a university-sanctioned excuse (debilitating illness, severe domestic affliction, religious conviction, or faculty approved activity), the weight of that midterm will be equally distributed to the remaining midterm exams and final exam. Missing an exam for other reasons will result in a grade of zero for that exam. A student who misses more than one midterm exam will not be eligible to pass the course and will receive a grade of F in the course.

Attendance at labs is mandatory. Students are expected to attend the lab sessions for which they are scheduled. If there is an occasion where a student is unable to attend their scheduled lab they should contact the lab coordinator, Dr. Flynn, using the course email address zool461@ucalgary, to determine if an alternative lab time can be arranged. If a student misses their lab for a reason other than a university-sanctioned excuse (debilitating illness, severe domestic affliction, religious conviction, or faculty approved activity), a score of zero (0) will be applied for that lab.

Lab reports will be submitted to an appropriate location (D2L or Gradescope) at a specified time after the completion of the lab. Late reports will receive a late penalty of 10% removed from the lab report grade for each day (24 hour period) it is late. Reports that are more than 4 days late (with no university sanctioned excuse) will receive a score of 0.

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

The following out of class activities are scheduled for this course.

Activity	Location	Date and Time	Duration
Midterm - 1	Online Exam	Wednesday, September 28, 2022 at 7:00 pm	1.5 Hours
Midterm - 2	Online Exam	Wednesday, November 2, 2022 at 7:00 pm	1.5 Hours
Midterm - 3	Online Exam	Monday, November 28, 2022 at 7:00 pm	1.5 Hours

**REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.** If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

There will be 3 midterm exams, scheduled Sept 28, Nov 3, and Nov 28 from 7-8:30 PM. The first (1st) midterm will cover Neurobiology, the second (2nd) midterm exam will cover Endocrinology lecture material, and the third (3rd) midterm will cover Muscle Physiology. The final exam will be during the final exam period and cover the Sensory physiology lecture material.

If you have an existing class conflict that requires your synchronous attendance during one of the scheduled exam periods, then please contact the course coordinator Dr. Vijayan (mmvijaya@ucalgary.ca) at least 2 weeks prior to the exam so that an alternative can be arranged. The alternative will consist of writing the exam at a different time the day it is scheduled. Students who write an exam at an alternate time will also be required to sign a confidentiality waiver indicating that they will not share details of the exams, nor will they knowingly receive details from other students.

The midterm and final exams will be designed to be written within 60 minutes, plus an additional 30 minutes to allow for technical issues (90 minutes total). Time will be adjusted for SAS students if needed and accommodations for students will be done on a case-by-case basis.

## 6. Course Materials:

Recommended Textbook(s):

Hill, Wyse, Anderson, *Animal Physiology*: Sinauer.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);

- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

## 7. Examination Policy:

**IMPORTANT:** Midterm exams and Final Exam will be administered online through the D2L course website. It is the student's responsibility to ensure they have adequate computer and internet access. Students will be required to begin their midterm exams promptly at 7:00 PM, and the final exam at the start of the registrar scheduled exam period. Students will have a 20 minute window in which to begin their exam.

If a student has NOT begun their exam within 20 minutes (7:20pm for the midterm exams), they will receive a grade of 0 (zero) for that midterm. If a student encounters any technical issues starting an exam, they **MUST** document the issue by taking a photo, screenshot, or video, and they must contact the instructor immediately so that either additional time can be provided to access the exam or alternative arrangements made. Students experiencing such difficulties who do not contact their instructor providing evidence of technical difficulties within 20 minutes of the scheduled start of the exam will not be allowed to write the exam and will receive a grade of zero (0) on the exam. If a student's exam is suspended for any reason (lost internet connection, internet browser crashes etc.), they **MUST** provide evidence (photo/screenshot/video) and contact the instructor immediately. Students will then be granted re-entry to suspended exams if they began the exam on time, provided evidence of the suspension, and still have time remaining to complete their exam.

All exams will have an additional 50% buffer time applied to accommodate any issues with online exams. Therefore, the exams can be completed in 1 hour, but students will be given 1.5 hours to complete the exam. If students have technical difficulties that are corrected within the duration of the 50% buffer time, no additional time will be granted. However, if the technical difficulties persist for a duration greater than the buffer time, additional time will be considered at the discretion of the instructor on a case-by-case basis.

Answers to questions on the exams are to be based on the lecture material you are provided, including the course text. While you are encouraged to access other resources (texts, etc.) to reinforce the lecture material and strengthen your comprehension, whether an exam answer is considered correct will be based on the information you are provided in lecture, not other resources. This is not intended to discourage further reading, but rather to discourage attempts to access disallowed resources during exams (see below).

The exams are 'open book' in the sense that you may access your own, previously existing, class notes during the exam. These must be your own notes only, which can include recorded lecture material that we provide to you, and you may only use notes that you have in your possession before the exam commences (i.e. you may not access other resources to supplement your notes during the exam). You may access lecture material from the course D2L website during exams, but it is advised to have your own copies of this material in case the D2L website becomes inaccessible during the exam. You may also use the course recommended text during exams, but not other texts.

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 **ten business 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 submit the Reappraisal of Graded Term work [form](#) to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. 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 Services:** For more information, see their [website](#) or call [403-210-9355](#).
- c. **Sexual Violence:** 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 ([syva@ucalgary.ca](mailto:syva@ucalgary.ca)) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)

Student Academic Misconduct [Policy](#) and [Procedure](#)  
[Faculty of Science Academic Misconduct Process](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

**e. Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Lisa Gieg by email [imgieg@ucalgary.ca](mailto:imgieg@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

**f. 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.

**g. Student Union Information:** [SU contact](#), Email SU Science Rep: [sciencerep1@su.ucalgary.ca](mailto:sciencerep1@su.ucalgary.ca), [Student Ombudsman](#)

**h. 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.

**i. 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.

Date	Lecture	Topic/Instructor	
September			
7	Introductions	Neurophysiology/ Dr. Corey Flynn	
9	Cell Types		
12	Passive Electrical Properties		
14	Passive Electrical Properties		
16	Ion Channels		
19	The Action Potential		
21	The Action Potential		
23	The Action Potential		
26	Hormone-target interactions and specificity	Endocrinology/ Dr. Matt Vijayan	
28	Hormone-target interactions and specificity		Midterm Exam <sup>1</sup>
30	National Day for Truth and Reconciliation NO LECTURE		
October			
3	Hormone-target interactions and specificity	Endocrinology/ Dr. Matt Vijayan	
5	Mechanisms of hormone action		
7	Mechanisms of hormone action		

10	Thanksgiving NO LECTURE		
12	Mechanisms of hormone action	Endocrinology/ Dr. Matt Vijayan	
14	Hypothalamic and pituitary hormone production and function		
17	Hypothalamic and pituitary hormone production and function		
19	Hypothalamic and pituitary hormone production and function		
21	Integrated control of growth, development, reproduction and metabolism		
24	Integrated control of growth, development, reproduction and metabolism		
26	Integrated control of growth, development, reproduction and metabolism		
28	Anatomy and sliding filament theory	Muscle Physiology/ Dr. Kelsey Lucas	
31	Anatomy and sliding filament theory		
November			
2	Excitation and contraction		Midterm Exam <sup>2</sup>
4	Excitation and contraction		
7 - 11	Term Break	NO LECTURE	
14	Mechanics and energetics	Muscle Physiology/ Dr. Kelsey Lucas	
16	Mechanics and energetics		
18	Control of muscle		
21	Smooth muscle		
23	Sensation and Perception	Sensory Physiology/ Dr. Corey Flynn	
25	Skin Receptors and Mechanoreception		
28	The Auditory System		Midterm Exam <sup>3</sup>
30	The Auditory System/Vestibular System		
December			
2	The Visual System		
5	The Visual System		
7	The Visual System		

**Course Outcomes:**

- Be able to explain how the anatomy and physiology of neurons contribute to the creation and maintenance of membrane potential and mechanisms of neuronal signalling including the synapse and action potential.
- Be able to explain the physiological basis of sensation and perception, including the design and function of important sensory systems including the skin, auditory, visual, vestibular and chemical sensation.
- Be able to explain how muscles are built from molecular to organ level, how they are regulated, how their anatomy and physiology give rise to emergent properties of muscle contraction, and the basis of neural control of muscles.
- Be able to explain how endocrine systems function, including hormone/target interactions, mechanisms of hormone function, hypothalamic-pituitary interactions, and regulation of growth, development, reproduction and metabolism.
- Be able to apply the physiological systems and principles under consideration to explain how they promote maintenance of homeostasis and normal body function in animals.
- Be expected to apply their knowledge about these systems to perform lab/inquiry-based experiments, and to collect and present their results in written scientific reports that demonstrate the ability to critically assess and explain their data.
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- Be able to explain how muscles are built from molecular to organ level, how they are regulated, how their anatomy and physiology give rise to emergent properties of muscle contraction, and the basis of neural control of muscles
- Be able to explain how endocrine systems function, including hormone/target interactions, mechanisms of hormone function, hypothalamic-pituitary interactions, and regulation of growth, development, reproduction and metabolism
- Be able to apply the physiological systems and principles under consideration to explain how they promote maintenance of homeostasis and normal body function in animals
- Be expected to apply their knowledge about these systems to perform lab/inquiry-based experiments, and to collect and present their results in written scientific reports that demonstrate the ability to critically assess and explain their data

Electronically Approved - Sep 05 2022 17:08

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**Department Approval**

Electronically Approved - Sep 06 2022 09:39

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**Associate Dean's Approval**