



COURSE OUTLINE

1. **Course:** ZOOL 463, Animal Physiology II - Winter 2024

Coordinator(s)

Name	Email	Phone	Office	Hours
Dr. Hamid Habibi	habibi@ucalgary.ca	403 220-5270	BI 276	By appointment

Section(s)

Lecture 01 : MWF 10:00 - 10:50 in ES 162

Instructor	Email	Phone	Office	Hours
Dr. Hamid Habibi	habibi@ucalgary.ca	403 220-5270	BI 276	By appointment
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	M, 11-12, & F, 1-2, in Drummond Hall (BI 192)
Dr Matt Vijayan	matt.vijayan@ucalgary.ca	403 220-3094	BI 268	By appointment

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).

Online Delivery Details:

Some aspects of this course are being offered in real-time via scheduled meeting times. For those aspects 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.

Lecture Material will be delivered synchronously and asynchronously, depending on who is teaching that component of the course, as follows:

Dr. Habibi will synchronously deliver most of his lectures in person. A small number of lectures will be recorded and posted to the D2L site for two weeks for you to access and review at your convenience (asynchronously). A tutorial will be arranged online to answer questions regarding the materials delivered asynchronously. All lecture notes will be posted to the D2L site for you to access.

Dr. Lucas will delivery her lectures in person and record them. All lecture notes, including live slide annotations, will be posted on D2L after the class session.

Dr. Flynn will deliver his lectures in person and record them. The recorded lectures will be posted to D2L.

Dr. Vijayan will synchronously deliver his lectures in person. All lecture notes will be posted on D2L.

Course Site:

D2L: ZOOL 463 L01-(Winter 2024)-Animal Physiology II

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, Arshad Ayyaz (

arshad.ayyaz@ucalgary.ca), or a committee representative of your choice at <https://science.ucalgary.ca/biological-sciences/about/equity-diversity-and-inclusion>

2. Requisites:

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

Prerequisite(s):

Zoology 461.

Antirequisite(s):

Credit for Zoology 463 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
Lab Reports ¹	24%	Ongoing		
Midterm Exam 1	20%	Feb 09 2024 at 07:00 pm (90 Minutes)	in-person	TBD
Midterm 2	20%	Mar 13 2024 at 07:00 pm (90 Minutes)	in-person	TBD
Registrar Scheduled Final Exam	36%	Will be available when the final exam schedule is released by the Registrar	in person	Will be available when the final exam schedule is released by the Registrar

¹ 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 $6 \times 4 = 24\%$ 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 in-person and on campus. [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 3 hours.

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:

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, 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, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this 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 zool463@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 Exam 1	TBD	Friday, February 9, 2024 at 7:00 pm	90 Minutes
Midterm 2	TBD	Wednesday, March 13, 2024 at 7:00 pm	90 Minutes

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.

If you have an existing class conflict that requires your 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.

6. Course Materials:

Recommended Textbook(s):

Hill, Cavanaugh, Anderson, *Animal Physiology*, 5th Ed: Sinauer.

John E. Hall, Michael E. Hall, *Guyton and Hall Textbook of Medical Physiology*, 14th Ed: Elsevier Canada.

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:

The Midterm and Final Exams will be administered in-person. These are closed book exams.

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 (svsa@ucalgary.ca) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.
- e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: science1@su.ucalgary.ca, science2@su.ucalgary.ca, science3@su.ucalgary.ca.
- f. **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 preferably 10 business days before the due date of an assessment or scheduled absence.

- g. **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](#)

- h. **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.
- i. **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.
- j. **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.

ZOOLOGY 463 PHYSIOLOGY II

LECTURE OUTLINE - WINTER 2024

General topic No. of Lectures Instructors

Body Fluids and Hemostasis: 3 Lectures, Dr. H.R. Habibi

Immunology: 3 Lectures, Dr. H.R. Habibi

Thermoregulation: 6 Lectures, Dr. H.R. Habibi

Respiration: 6 Lectures, Dr. K. Lucas

Circulation: 5 Lectures, Dr. K. Lucas

Renal: 6 Lectures, Dr. C. Flynn

Gastrointestinal Physiology: 6 Lectures, Dr. M.M. Vijayan

Body Fluids & Hemostasis (H Habibi, 3 lectures)

Jan 8-12 (in person; synchronous)

Body fluids and compartments

Blood cells and Hemostasis

Blood clotting

Immunology (H Habibi, 3 lectures)

Jan 15-19 (in person; synchronous)

Leucocytes and Innate Immunology

Acquired Immune system

Integrated immune response

Thermoregulation (H Habibi, 6 lectures)

Jan 22 – Feb 2 (in person; synchronous)

Body temperature and metabolism

Heat exchange mechanisms

Thermoreceptors & thermoregulation

Hypothermia, hyperthermia and pyrexia

(Hybrid; asynchronous)

Heterothermy and Hibernation

Thermoregulation in Poikilotherms

February 9, 2024, Mid-Term Exam 1 (lectures 1-12) (7:00 – 8:30 pm)

Renal Physiology (C. Flynn, 6 lectures)

Feb 5 – 16 (in person; synchronous)

Principles of osmotic and ionic regulation

Osmotic Regulation in Fish

Ion Transport in Gills

Terrestrial Osmoregulation

Mammalian Renal Physiology

Feb 18-24, MID-TERM BREAK, NO LECTURES or LABS

Respiration (K. Lucas, 6 lectures)

Feb 26 – Mar 8 (in person; synchronous)

Lung/gill structure & mechanics

Gas properties and diffusion

Ventilation & perfusion

O₂ and CO₂ transport.

CO₂ and acid/base regulation

Control & Respiratory stress

March 13, 2024, Mid-Term Exam2 (lectures 13-24) (7:00 – 8:30 pm)

Circulation (K. Lucas, 5 lectures)

Mar 11 – 20 (in person; synchronous)

Pipe flow, System components & functions

Comparative anatomy & function

Cardiac muscle & contraction

Heart electrical properties & signals

Control of cardiac output

Control of blood pressure

Gastrointestinal Physiology (M. Vijayan, 6 Lectures)

Mar 22-April 8 (in person; synchronous)

Gastrointestinal control systems

Gastric motility

Gastric secretion

Liver and Biliary system

Intestinal digestion & absorption I

Intestinal digestion & absorption II

Laboratory Schedule 2024

Date Lab Exercise

Jan. 16 - 18 Lab 01 – Hematology

Jan. 30 – Feb. 1 Lab 02 – Immunology

Feb. 13 – 15 Lab 03 – Renal Function

Feb. 19 – 23 NO LABS (Reading Week)

Mar. 5 – 7 Lab 04 – Mechanics and Control of Ventilation

Mar. 19 – 21 Lab 05 – Cardiovascular Physiology

April 2 – 4 Lab 06 – Acid-Base Balance

Course Outcomes:

- General concept of body Fluids and Hemostasis. Emphasis will be placed on body fluid composition and compartments, blood cells and Hemostasis and mechanisms of preventing blood loss by initiation blood clotting
- Body defense system and basis for innate and adaptive immune response. Students will understand the basis for hypersensitivity, cell mediated and humoral immunity. They will also have an understanding of the mechanism of histocompatibility.
- Thermoregulation and mechanisms metabolism and temperature control in endotherm and ectotherms. Students will have an understanding of heat exchange mechanisms and thermoreceptors, and physiological mechanisms of dealing with extreme heat and cold.
- Demonstrate understanding of the osmoregulatory challenges facing various organisms and compare/contrast the different ways these challenges are overcome. Demonstrate deep understanding of the anatomy and function of the mammalian nephron.
- Explain how the design of respiratory systems facilitates exchange of gasses between the animal and environment, how these structures are regulated, how differences between water and air impact these designs and their regulation, and how and why gasses are transported in blood in the forms they are.
- Explain how the hearts of animals are designed to circulate fluids through the body, how the design of the heart and central circulation reflect differences in the medium in which the animal lives and metabolic rate, how the heart functions as an effective pump, and how the cardiovascular system responds to metabolic demand and controls blood flow.
- Students are expected to have a basic understanding of the functioning of the gastrointestinal tract. They should be familiar with the regional specificity of digestion and absorption in the GI tract. The focus will be on the cellular mechanisms involved in the digestion and absorption of nutrients.
- The students will also have a general understanding of how the GI function is regulated by the nervous and endocrine system.
- Students will be expected to apply their knowledge about these systems to perform lab/inquiry-based experiments, and to collect, assess, and present their results in written scientific reports that demonstrate the ability to critically assess and explain their data.

Electronically Approved - Jan 02 2024 08:52

Department Approval

Electronically Approved - Jan 03 2024 09:17

Associate Dean's Approval