



## COURSE OUTLINE

### 1. **Course:** ZOOL 461, Animal Physiology I - Fall 2021

#### **Coordinator(s)**

<b>Name</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
Dr Corey Flynn	cflynn@ucalgary.ca	403 220-5055	BI 448	By Appointment Only
Professor Hamid Habibi	habibi@ucalgary.ca	403 220-5270	BI 276	By Appointment

#### **Section(s)**

Lecture 01: MWF 09:00 - 09:50 - Online

<b>Instructor</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
Professor 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
Keenan MacDougall	TBA	TBA	TBA	TBA

Welcome to Zoology 461 Animal Physiology.

You will interact with 3 instructors in the lecture/lab component of the course.

Dr. Hamid Habibi, who is also the course coordinator, and you should contact him for administrative matters surrounding lectures and examinations.

Dr. Corey Flynn, who is also the lab coordinator, and you should contact him for administrative matters surrounding labs such as scheduling and attendance. For lab related matters, please use the lab email address [zool461@ucalgary.ca](mailto:zool461@ucalgary.ca).

Keenan MacDougall ([keenan.macdougall1@ucalgary.ca](mailto:keenan.macdougall1@ucalgary.ca))

Please communicate with your instructors using the email addresses above, and be mindful that while we will attempt to respond as quickly as possible, it might take a day or two, and we may not be able to respond on weekends.

You will also interact with the lab technicians and TAs, and will hear more about this during labs.

#### **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.

This course has a registrar scheduled, synchronous final exam. The writing time is 0.6667 hours + 50% buffer time.

The lecture and lab material, and examinations, will be delivered online via Zoom and the course D2L website. There are no in-person components to the course. Thus, you are required to have adequate access to technology as per the statement in Course Materials below. Note, while not required, a Webcam/Camera (built-in or external) and Microphone and Speaker (built-in or external), or headset with microphone are strongly suggested as they will be helpful for communication with your classmates and instructors during Zoom meetings as expected during the labs

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

Dr. Habibi (Endocrinology) and MacDougall (Muscle physiology) will record their lectures and post them to the D2L site for you to access and review at your convenience (asynchronous); there will not be live/synchronous lectures for these segments of the course. However, Dr. Habibi and MacDougall will have a live/synchronous session at the end during lecture hour to answer any questions. Habibi Q/A session on November 19 at 9:00 -9:50 am; MacDougall Q/A session on December 8 at 9:00-9:50 am.

Dr. Flynn (Neurophysiology and Sensory physiology) will have live/synchronous lectures via Zoom during the regularly scheduled lecture time, but will also record these lectures and post them to the D2L site should you not

be able to attend the lectures.

In all cases, students will be responsible for reviewing the lecture material prior to any exam that covers that material.

See the detailed lecture and exam schedule below.

**Labs will be delivered synchronously, and you are expected to attend your scheduled lab session via ZOOM.**

The laboratory component will consist of 6 Lab Exercises. You do not need to be physically present in the lab, however, you will be required to attend your scheduled lab session via a Zoom meeting. During the lab you will watch the experiments being completed and participate in discussions of the concepts and techniques being used. Each student will receive an 'Engagement Score' based on your participation during the labs. You will be required to answer questions and contribute to the discussions of the lab experiments. After the lab is completed, you will be provided with data from each lab exercise that you will use to complete a lab report or lab quiz. Further information about the lab exercises, reports, quizzes, etc will be provided on the D2L website.

**Exams will be delivered synchronously through the course D2L website.**

There will be two evening midterm exams, Oct 19, and Nov 23, starting at 7PM and running until 8:30. There will also be a registrar scheduled final exam. All the exams will have a specific start time and duration, and you will be expected to be online to access the exams during these time periods. See Out of Class Activities below for details.

**Course Site:**

D2L: ZOOL 461 L01-(Fall 2021)-Animal Physiology I

**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):**

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:

Component(s)	Weighting %	Date
Lab: 6 labs worth 3.5% each	21	Synchronous during your scheduled lab time
Lab Engagement Score	3	Synchronous during your scheduled lab time
Midterm Exam 1 (Flynn)	34	Oct 19: 7-8:30 PM synchronous
Midterm Exam 2 (Habibi)	25	Nov 23: 7-8:30 PM synchronous
Final Exam:	17	Registrar scheduled, 1 hour, synchronous

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 final exam that will be scheduled by the Registrar. [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 0.6667 hours.

The final exam will be administered using an on-line platform. 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.**

**Students who miss more than one midterm exam will not be eligible to pass the course. A final grade of F will be given to students who miss more than one midterm exam.**

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](mailto: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 dropbox in D2L 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	On-line	Tuesday, October 19, 2021 at 7:00 pm	90 Minutes
Midterm 2	On-line	Tuesday, November 23, 2021 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.

**There will be 2 midterm exams, scheduled Oct 19, and Nov 23 from 7-8:30 PM. The first exam will cover covering Neurobiology, Sensory Physiology and Perception lecture material, and the second exam will cover Endocrinology lecture material.**

**The final exam will be 40 minutes long (40 + 20 min buffer = total 60 min) and cover Muscle 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. Habibi (habibi@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 waver indicating that they will not share details of the exams, nor will they knowingly receive details from other students.**

**The midterm 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.**

**The final exam will be registrar scheduled, and will be written synchronously during the time period assigned. It will be designed to be written within 40 minutes, plus an additional 20 minutes to allow for technical issues (1 hour 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, 4th edition: Sinauer.***

**The course text is recommended, to help you prepare for or review lecture material. However, you are not required to have the text for the course, and all material that you are responsible for will be provided in lecture. Examinations will be based on lecture material only, and will be based on the lecture material provided/delivered by your instructors. Suggested readings from the textbook, if any, are only to help reinforce the lecture material, and you will not be tested on any material from the text that is not also covered in lecture.**

**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 midterm exams can be completed in 1 hour, but students will be given 1.5 hours to complete the exam (For the final exam, 40 minutes + 20 minute buffer = 60 minutes). 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.

No other aids are allowed on tests or examinations, including accessing internet resources such as search engines (Google etc), other websites, shared documents (Google docs etc) or chat servers (Discord, WhatsApp etc), etc., and you are specifically prohibited from working with or contacting any other individuals while you complete the exam. Violation of these rules is considered academic misconduct with penalties as described in the University Calendar section K.

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 [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel: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](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence-Policy.pdf>)
- 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](#)  
[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 [lmgieg@ucalgary.ca](mailto:lmgieg@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: [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).

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.

Full lecture and lab schedules will be available on D2L.

**Lecture and Midterm Examination Schedule - 2021**

Sept 8 - 24: Neurobiology (C. Flynn), 8 lectures, SYNCHRONOUS

Delivery via ZOOM during scheduled lecture time (MWF, 9:00am - 9:50am) Synchronous lectures will be recorded and made available on D2L.

Topics:

Introduction to Neurobiology.

**Passive Electrical Properties.**

**Ion Channels.**

**The Action Potential.**

**Synapses.**

**Synaptic Plasticity**

**Oct 11 - Thanksgiving Day (University Closed, No lecture)**

**Sep 27 - Oct 15: Sensory Physiology and Perception (C. Flynn), 8 lectures, SYNCHRONOUS**

**Delivery via ZOOM during scheduled lecture time (MWF, 9:00am - 9:50am) Synchronous lectures will be recorded and made available on D2L.**

**Topics covered:**

**Sensation and Perception.**

**Skin Receptors and Mechanoreception.**

**The Auditory System.**

**The Vestibular System.**

**The Visual System.**

**Oct 19 - FIRST MIDTERM EXAM 7:00pm - 8:30 PM**

**Online Synchronous**

**Covering lecture material from Sept 8th - Oct 15th (Neurobiology, Sensory Physiology and Perception)**

**Oct 18 - Nov 19: Endocrinology (H. Habibi), equivalent of 12 lectures, ASYNCHRONOUS**

**Delivery, recorded lectures provided on D2L website**

**Topics Covered:**

**Hormone-target interactions and specificity.**

**Mechanisms of hormone action.**

**Hypothalamic and pituitary hormone production and function.**

**Integrated control of growth, development, reproduction and metabolism.**

**Nov 8-12 READING DAYS (University Closed, No lectures)**

**Oct 23 - SECOND MIDTERM EXAM 7:00pm - 8:30 PM**

**Online Synchronous**

**Covering lecture material from Oct 18th - Nov 19th (Endocrinology)**

**Nov 22 - Dec 8: Muscle Physiology (Keenan MacDougall), equivalent of 8 lectures, ASYNCHRONOUS**

**Delivery, recorded lectures provided on D2L website**

**Topics Covered:**



**Anatomy, ultrastructure, sliding filament theory.**

**Excitation-contraction coupling.**

**Mechanics, contractile properties.**

**Energetics, fibre types.**

**Neural control, muscle spindles.**

**Control of movement, reflexes and fixed action patterns.**

**Smooth Muscle.**

**Muscle lecture material will be covered on the final exam (Registrar Scheduled)**

### **LABORATORY SCHEDULE**

<u>Date:</u>	<u>Laboratory Exercise</u>
Sept. 14 - 21	Lab 01 - Tonicity and Cell Volume
Sept 28 - Oct. 7	Lab 02 - Action Potentials in Earthworm Giant Axons
Oct. 12 - 19	Lab 03 - Senses and Reflexes
Oct. 26 - Nov. 2	Lab 04 - Endocrine Disorders
Nov. 8 - 12	READING BREAK - No labs
Nov. 16 - 23	Lab 05 - Mechanical Properties of Skeletal Muscle
Nov. 30 - Dec. 7	Lab 06 - Physiological Properties of Visceral Smooth Muscle

### **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.**
- **Be able to explain how the anatomy and physiology of neurons contribute to the creation and maintenance of membrane potential and mechanisms of neuronal signaling 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**

**Electronically Approved - Sep 02 2021 08:23**

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**Department Approval**

**Electronically Approved - Sep 02 2021 11:04**

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**Associate Dean's Approval**