UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Biological Sciences
BI 186
403 220-3140
biosci@ucalgary.ca

COURSE OUTLINE

1. **Course:** ZOOL 461, Animal Physiology I - Fall 2019

   Lecture 01: MWF 09:00 - 09:50 in ENG 60

Instructor	Email	Phone	Office	Hours
Dr Douglas Syme	syme@ucalgary.ca	403 220-5281	BI 262	By Appointment
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

   Course Site:

   D2L: ZOOL 461 L01-(Fall 2019)-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
Midterm Examination (Lecture)	34%	Thurs. Oct. 17
Laboratory Reports (5 x 4% each + 1 x 2%)	22%	
Final Examination (Lecture)	44%	

   There will be a Final Exam scheduled by the Registrar's Office.

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

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

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	90 %	85 %	80%	75%	71 %	67 %	63%	59%	55 %	50 %

   NOTE: Students who do not achieve a passing grade (D minimum) on the weighted combination of the Midterm and Final exams will receive an F in the course, regardless of their lab grade.

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

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

   The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize themselves with these regulations. See also

Section E.3 of the University Calendar.

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

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

Activity	Location	Date and Time	Duration
MT Exam	TBA	Thursday, October 17, 2019 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.

6. **Course Materials:**

Recommended Textbook(s):

Hill, Wyse, Anderson, *Animal Physiology, 4th edition*: Sinauer.

7. **Examination Policy:**

No aids are allowed on tests or examinations, unless explicitly noted to the class.

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 be expected to participate as subjects or participants in projects.

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 **10 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 immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections I.1 and I.2 of the University Calendar

b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

12. **Other Important Information For Students:**

a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website (Mental Health).

b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call 403-210-9355.

c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at 403-220-2208 .

d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples**.

e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.

f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at procedure-for-accommodations-for-students-with-disabilities.pdf.

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email addy@ucalgary.ca or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See Section E.4 of the University Calendar.

g. **Safewalk:** Campus Security will escort individuals day or night (See the Campus Safewalk website). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see Legal Services website.

i. **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: ombuds@ucalgary.ca.

j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned

off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.

k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

l. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or non-academic misconduct, in addition to any other remedies available at law.

LECTURE OUTLINE - 2019

Neurobiology: C. Flynn, Sept 6 – 23 (8 lectures)

Introduction to Neurobiology.
Passive Electrical Properties.
Ion Channels.
The Action Potential.
Synapses.
Synaptic Plasticity

Muscle Physiology: D. Syme, Sept 25 – Oct 11 (8 lectures)

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.
Comparative muscle physiology (if time).

Oct 14 Thanksgiving Day, no lecture.

Oct 17 MIDTERM EXAM 19:00-20:30, location TBA, lectures 1-16

Endocrinology: H. Habibi, Oct 16 – Nov 18 (12 lectures)

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 11-15 READING DAYS, NO LECTURE

Sensory Physiology and Perception C. Flynn, Nov 20 – Dec 6 (8 lectures)

Sensation and Perception.
Skin Receptors and Mechanoreception.
The Auditory System.
The Vestibular System.
The Visual System.
The Chemical Senses

LABORATORY SCHEDULE - 2019

Date: Laboratory Exercise

Sept. 10 – 17 1. Tonicity and Cell Volume

Sept 24 - Oct. 1 2. Action Potentials in Earthworm Giant Axons

Oct. 8 – 15 3. Physiological and Pharmacological Properties of

Visceral Smooth Muscle

Oct. 22 – Oct. 29 4. Endocrine Disorders: an Investigative Exercise

Nov. 5 - 7 5. Mechanical Properties of Skeletal Muscle

(Sections B01 – B06)

Nov. 11 – 15 READING BREAK – No labs

Nov. 19 5. Mechanical Properties of Skeletal Muscle

(Section B07- B08)

Nov. 26 - Dec. 3 6. Senses and Reflexes

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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Department Approval:	Electronically Approved	Date: 2019-09-03 09:27
Associate Dean's Approval for out of regular class-time activity:	Electronically Approved	Date: 2019-09-03 13:30