UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Biological Sciences
BI 186
403 220-5261
biosci@ucalgary.ca

COURSE OUTLINE

1. **Course:** BIOL 371, Comparative Biology of Plants and Animals - Fall 2022

Coordinator(s)

Name	Email	Phone	Office	Hours
Dr Marcus Samuel	msamuel@ucalgary.ca	403 210-6459	BI 392	Contact through Email
Mr. Neil Hickerson	nmhicker@ucalgary.ca	403 220-6130	BI 391A	By appointment

Section(s)

Lecture 01 : MWF 12:00 - 12:50 in ICT 102

Instructor	Email	Phone	Office	Hours
Dr Jessica Theodor	jtheodor@ucalgary.ca	403 210-9819	BI 353	contact by e-mail
Dr Marcus Samuel	msamuel@ucalgary.ca	403 210-6459	BI 392	Contact through Email
Dr Eve Robinson	eve.robinson@ucalgary.ca	403 220-8287	BI 429D	contact by email

Lecture 02 : MWF 14:00 - 14:50 in ICT 102

Instructor	Email	Phone	Office	Hours
Dr Marcus Samuel	msamuel@ucalgary.ca	403 210-6459	BI 392	Contact through Email
Dr Eve Robinson	eve.robinson@ucalgary.ca	403 220-8287	BI 429D	contact by email
Dr Jessica Theodor	jtheodor@ucalgary.ca	403 210-9819	BI 353	contact by e-mail

Welcome to Biol 371 Comparative Biology of Plants and Animals

Be sure to check your UofCalgary email account regularly, as we will be sending out reminders and relevant information/updates to help you keep pace with the course and activities.

If you have questions about administrative matters related to the course, they should be directed to the course coordinators, Neil Hickerson and Dr. Samuel. If you have questions about the lecture content, they should be directed to whomever is delivering that specific lecture material, using the email addresses indicated above. If you have questions about tutorial material, they should be directed to the TAs (contact information can be found on the course D2L website).

We will endeavor to respond to emails as quickly as possible, but in some cases it may take a day or two, and we may not be able to respond on weekends.

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:

Course coordinators: Mr. Neil Hickerson (nmhicker@ucalgary.ca); Dr. Marcus Samuel (msamuel@ucalgary.ca)

1) Lecture material will be presented in-person during the scheduled times.

2) Tutorials are completed through the course D2L site. There are 4 tutorials with dues dates throughout the term (as described below).

3) There will be one midterm exam (60 min) administered in-person as an out-of-class activity in Oct.

4) The final exam is a registrar scheduled timed exam and is designed to take 2 hrs to write. Students will start at the registrar scheduled time. Time will be adjusted for SAS students if needed and accommodations for students will be done on a case-by-case basis.

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.

Course Site:

D2L: BIOL 371 L01-(Fall 2022)-Comparative Biology of Plants and Animals

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

ABOUT BIOLOGY 371:
The course is intended to teach you about the origins and functional underpinnings of the biology of plants and animals. It will do so in a manner that integrates an appreciation of their shared origins as eukaryotic, multicellular organisms, but that have also diverged in important ways. It is not a course that is half about plants and half about animals, but rather the lecture material will be organized around “themes” expressing common challenges faced by plants and animals, manifest as selective forces that make evolutionary demands on them, and how their biology is reflected through similarities and differences in their responses to dealing with such demands. This approach will build an understanding of the biology of plants and animals in a way that allows students to grasp the history and foundation of that biology, allowing them to think broadly about similarities and differences between plants and animals, as opposed to considering plants and animals in isolation.

The course is taught by three instructors, Dr. Theodor and Dr. Robinson who will focus on aspects of the biology of animals, and Dr. Samuel who will focus on the biology of plants. Together we will work through 5 different 'themes' that deal with different aspects of plant/animal biology, and in so doing hope to have you see similarities and differences in how these two groups of organisms have come to be and live.

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), 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):
Biology 241 and 243.

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
Tutorial1	6%	Sep 21 2022		
Tutorial 2	6%	Oct 14 2022		
Midterm	36%	Oct 27 2022 at 06:30 pm (1 Hours)	in-person	TBD
Tutorial 3	6%	Nov 18 2022		
Tutorial 4	6%	Dec 05 2022		
Registrar Scheduled Final Exam	40%	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

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%	76%	72 %	68 %	64%	60%	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 2 hours.

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.

COURSE POLICY ON MISSED MIDTERM EXAMS AND TUTORIAL ASSIGNMENTS:
If you have a conflict with registrar-scheduled class or activity, you must inform the course coordinators (nmhicker@ucalgary.ca; msamuel@ucalgary.ca) of this conflict before the end of September.

As the tutorial assignments are self-paced and accessible well in advance of the due date, the expectation that an assignment be completed will not be waived.

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

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

Activity	Location	Date and Time	Duration
Midterm	In-person	Thursday, October 27, 2022 at 6:30 pm	1 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):

Russell, Hertz, McMillan, Fenton, Maxwell, Haffie, Milsom, Nickle, Ellis, *Exploring the Diversity of LIfe: Biology*. Nelson Education Limited. 4th Canadian Edition..

COURSE TEXT: The lecture material does not follow the content of introductory biology textbooks closely, thus the use of a text is not essential. The recommended text is thus not necessary to have and you will not be assigned readings from the text for lecture purposes, however, you may wish to consult the text for further reading or review of material presented in lecture, for help with tutorial assignments, and we will use figures from the text in lecture.

The recommended text is the same text that you used for Biol 241 and 243. Alternatively, if you have or have access to a copy of another introductory biology text, it will likely suffice.

NOTE: The lectures will be in person. You are encouraged to attend the lectures on the dates listed below to participate in the class discussion or to ask questions about the material. The schedule is provided as a guide to the major themes of the course material to be presented in a logical and timely fashion, so you are prepared for examinations. Incomplete lecture notes will be available through D2L to act as a guide for the lectures provided on the dates posted below. Everything provided during lectures is testable content.

Tutorial Assignments

Students will have the opportunity to demonstrate learning and comprehension through 4 tutorial assignments. These assignments will consist of selected readings from journal articles, books, and the web, followed by an evaluation (Quiz) of learning/comprehension.

Tutorials will be administered through the course D2L website (under the Assessments, Quizzes tab); you are not required to attend a set tutorial session. We will let you know when each tutorial is ready to access. You will then be directed to readings, and when you have completed the reading you will take a quiz consisting of about 20 multiple-choice questions. You can work at each tutorial at your own pace, and will have about 2 weeks to complete each from the time they are made available. Further details about the tutorials will be available on the D2L course website, including how to access the tutorials, time limits, and how to submit your quiz when complete. Please read this information carefully.

Late assignments will not be accepted and a grade of zero will be given if assignments are not submitted by the deadline.

Tutorial 1: Rise of Multicellular Life – Due September 21st

Tutorial 2: Plant Structure and Function – Due October 14th

Tutorial 3: Water to Land Transition – Due November 18th

Tutorial 4: Homeostasis – Due December 5th

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.

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:**

   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 or incorrect 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 other resources during exams.

   The exams are closed book. You may not access your lecture notes or any other resources during exams. 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 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. **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 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: SU contact, Email SU Science Rep: 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.**

Lecture Material: Course Themes

Theme 1: Evolutionary Underpinnings of Plant and Animal Biology – Where did it all come from? Evolutionary origins of eukaryotic life, relationships between plants/animals and other forms of life, the rise of multicellular and complex life.

September 7th - 14th (Dr. Theodor)

Theme 2: Origins of Plants and Animals and Introduction to Diversity and Classification –

Origins of Plants and Animals and Introduction to Diversity and Classification –Understanding evolutionary origins of plant and animal structure, function and diversity. Evolutionary origins of plants and animals, similarities and differences between plants and animals and how/why these might arise, the functional basis of mobility, the basis of classification, introduction to diversity of plant and animal life.

September 16th - 26th (Dr. Theodor): Intro to concepts, origins of plants and animals and implications, survey of animal diversity

September 28th - October 14th (Dr. Samuel): Plant structure/function, survey of plant diversity

Theme 3: Environment Matters – Life in the water and on land. Major features and challenges of these environments, the challenges and circumstances of moving from water to land.

October 17th - 21st (Dr. Samuel): Introduction to concepts, plants in aquatic and terrestrial environments

October 24th - 28th (Dr. Robinson): Animals in aquatic and terrestrial environments

****Midterm Exam – October 27th (Evening): covers material from Themes 1 and 2. This is a scheduled out-of-class-time-activity. REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. Any requests for deferral based on time conflicts with other scheduled course activities must be made by no later than 14 days prior to the exam date in order to accommodate and schedule make-up exams. SAS requests must be set up with Student Accessibility Services from the following link:https://clockwork.ucalgary.ca/ClockWork/custom/misc/home.aspx .**

Theme 4: Homeostasis to survive and thrive – Osmoregulation, circulation and gas exchange. The need for homeostasis, concepts of osmosis and transport, osmoregulation in plants and animals and in different environments, and the need and designs for circulation and gas exchange.

October 31st - November 14th (Dr. Robinson): Introduction to concepts, osmoregulation, excretion, circulation, and gas exchange in animals

November 16th - 28th (Dr. Samuel): Osmoregulation, transport/circulation, and gas exchange in plants

Theme 5: Evolution of Sex, Early Development and Growth – birds and bees, trees and forests. Benefits and challenges of reproduction, similarities and differences in strategies used by plants and animals to fertilize, how environment impacts reproductive strategy, early development and growth, and how body form reflects aspects of plant/animal biology.

November 30th - December 2nd (Dr. Samuel): Introduction to concepts, reproduction and development in plants

December 5th - 7th (Dr. Robinson): Compare with animal reproduction and development

**Final Exam: covers material from Themes 3, 4 and 5. Registrar scheduled exam during the exam period (December 10th-21st). Requests for deferral must be made through the registrar's office at least 1-week prior to the exam. Last-minute requests may not be processed in time. Plan accordingly.

Course Outcomes:

- **Be able to explain how evolutionary events in the history of life have led to the rise of multicellular eukaryotic organisms, specifically the plants and animals and key characteristics that shape their biology**
- **Have the ability to identify to identify a broad diversity of plant and animal life (from the perspective of major phyla), explain the scientific bases for defining the major clades of plants and animals, and be able to identify key characteristics of these major groups to help inform further discussion about plant and animal biology**
- **Be able to compare and contrast how and why plants and animal cope with challenges faced by large, multicellular eukaryotes, including water-to-land transitions, and homeostatic mechanisms including osmoregulation/excretion pH, circulation and gas exchange**
- **Be able to assess the merits of the different strategies available to, and used by, plants and animals to reproduce, the impact of environment on reproductive strategy, and describe early events in development and how these lead to the essential structures and body plans of plants and animals**
- **Be able to read primary literature and identify the information used to draw conclusions from that literature, and draw their own conclusions from data in the literature**
- **Be prepared for more advanced study of plant and animal biology**

Electronically Approved - Sep 06 2022 16:27

Department Approval

Electronically Approved - Sep 08 2022 09:14

Associate Dean's Approval