UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

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

COURSE OUTLINE

1. **Course:** BIOL 241, Energy Flow in Biological Systems - Spring 2021

   Lecture 01: MWF 09:00 - 10:50 - Online

Instructor	Email	Phone	Office	Hours
Dr. Kate St. Onge	kate.stonge@ucalgary.ca	NA	REMOTE	W-F 11.00-11.45
Dr. Robin Cuthbertson	rscuthbe@ucalgary.ca	TBA	TBA	Via Zoom.

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 1 hours + 50% buffer time.

Lecture 01: MWF 09:00 - 10:50 – Online (Lectures will be delivered both synchronously and asynchronously)

Laboratory Sections 1-3: TR 13:00 - 15:45 – Online (Labs are delivered synchronously and attendance is mandatory)

Laboratory Sections 5-6: TR 9:00 - 11:45 – Online (Labs are delivered synchronously and attendance is mandatory)

Remote Learning Supplemental Information:

Some aspects of this course will be offered in real-time (synchronous) via scheduled meeting times and others will not require you to be online at the same time (asynchronous). Please refer to the details below for more complete information.

Remote Learning Details:

Lectures will be delivered both synchronously and asynchronously.

Dr. St. Onge will deliver both synchronous and asynchronous lectures. Synchronous lectures are via Zoom, they will be recorded. Zoom links and recordings will be posted in D2L. Asynchronous lecture recordings will be posted to D2L.

Dr. Cuthbertson will deliver all lectures asynchronously, with possible synchronous drop-in times for review (TBA on D2L). Asynchronous lecture recordings will be posted to D2L.

Laboratories will be synchronous and delivered live during the scheduled laboratory times (labs will not be recorded). Teaching assistants will be available in real-time for "office hours" during the scheduled lab time and then by email outside of lab time.

Course Site:

D2L: BIOL 241 L01-(Spring 2021)-Energy Flow in Biological Systems

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 30 and Chemistry 30.

Antirequisite(s):
Credit for Biology 241 and 205 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
Syllabus assignment and quiz	2	details provided on D2L
2 podcast assignments	8	details provided on D2L
5 Lecture Tests	58	May 12, May 19, May 26, June 7, June 14
5 Laboratory exercises	20	see course schedule
Lecture Final Examination	12	scheduled 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	92 %	88 %	84 %	80%	76%	72 %	68 %	64%	60%	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 1 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.

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.

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

There are no scheduled out of class activities for this course.

6. **Course Materials:**

Recommended Textbook(s):

Russell et al., *Exploring the Diversity of Life (4th Canadian Ed.)*: Nelson Education Ltd..

Ruler, scientific calculator, ruled paper, blank paper, grid paper

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:**

Tests/exams in this course are open book and you may use any course materials when writing tests/exams. However, no other aids are allowed on tests/exams, including accessing internet resources such as search engines (Google, etc.), other websites, shared documents (Google docs etc.) or chat servers (Discord, WhatsApp, etc.), and you are specifically prohibited from working with or contacting any other individuals while you complete these tests/exams. Violation of these rules is considered academic misconduct with penalties as described in the University Calendar section K.

IMPORTANT: It is the student's responsibility to ensure that they have adequate computer and internet access to write the exams. Students will be required to begin their exams promptly at the start of their scheduled class on the day of the exam. If a student encounters any technical issues in 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 claiming such difficulties who do not contact their instructor providing evidence of technical difficulties within 15 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 during the exam (lost internet connection, internet browser crashes etc.), they MUST provide evidence as outlined above 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.*

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 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 at (https://www.ucalgary.ca/policies/files/policies/sexual-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 theStudent Success Centre Academic Integrity page

e. **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.

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 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: 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.

Biology 241 Tentative Lecture*, Lecture Test** and Lecture Assignment Schedule***

Week	Dates	Topics	Tests and Assignments	Instructor
Week 1	Wed May 5	Topic 1 Classification		Dr. Kate St.Onge
	Fri May 7	Topic 2 Thermodynamics		
Week 2	Mon May 10	Topic 3: Membranes		
	Wed May 12	Topic 4: Enzymes	Test 1: Topics 1 + 2 (10%)	
	Fri May 14			
Week 3	Mon May 17	Topic 5: Heterotrophy		
	Wed May 19	Topic 6: Autotrophy	Test 2: Topics 3 + 4 (12%)	
	Fri May 21			
Week 4	Victoria day	---		
	Wed May 26	---	Test 3: Topics 5 + 6 (12%)	
	Fri May 28	Topic 7: Energy Budgets		Dr. Robin Cuthbertson
Week 5	Mon May 31			
	Wed Jun 2	Topic 8: Thermoregulation		
	Fri Jun 4	Topic 9: Locomotion		

Week 6	Mon Jun 7	Topic 10: Reproduction	Test 4: Topics 7 + 8 (12%)
	Wed Jun 9		
	Fri Jun 11	Topic 11: Ecosystem Energetics Topic 12: Nutrient Cycling	
Week 7	Mon Jun 14		Test 5: Topics 9 + 10 (12%)
	Wed Jun 16		
Final period	Jun21-23		Test 6: Topic 11 + 12 (12%)

* Most lectures are asynchronous/pre-recorded videos posted to D2L. Some lectures are synchronous/live via Zoom. Pay close attention to the D2L calendar.

**All Lecture Tests will be delivered through D2L. They will be available from 9:00am to 9:00pm on the scheduled day, but your attempts are time limited (45mins + 23mins buffer time). Start your attempt no later than 7.52pm to receive the full 68 mins! All attempts are automatically submitted at 9:00pm on the test date.

***All assignments (including podcast questionnaires) are due at 11.59pm on due dates. All assignments MUST be submitted to the D2L dropbox.

Biology 241 Spring Term 2021

Laboratory and Laboratory Assignment Schedule

All labs are scheduled on Thursdays. Lab are synchronous via Zoom and attendance is required. There are 4 graded SimBio Exercised. There are 4 grades Laboratory Assignments. Laboratories account for 20% of your final grade.

A maximum grade of D+ will be award if you do not complete the Laboratory component of this course.

Week	Date	Lab Topic	SimBio exercise and graded questions*	Assignment due in D2L dropbox**
1	Thurs May 6	Lab 1: Scientific Investigation	---	---
2	Tues May 11	---	---	Scientific Investigation Assignment (2%)
	Thurs May 13	Lab 2: Results and Citing Literature	Action Potentials Explored (2%)	---
3	Tues May 18	---	---	Results and Citation Assignment (2%)
	Thurs May 20	Lab 3: Cellular Respiration Explored	Cellular Respiration Explored (2%)	---
4	Tues May 25	---	---	Cellular Respiration Assignment (3.5%)
	Thurs May 27	---	---	---
5	Tues June 1	---	---	---
	Thurs June 3	Lab 4: Nutrient Pollution	Nutrient Pollution (2%)	---
6	Tues June 8	---	---	---
	Thurs June 10	Lab 5: Keystone Predator	Keystone Predator (2%)	Nutrient Pollution Assignment (4.5%)
7	Last day of Class Wed Jun 16	---	----	---
	Final exam Jun21-23	---	---	---

*SimBio exercise questions and graded questions must be submitted before the end of the day (11.59PM), the same day as your lab. The expected completion time for each SimBio exercise is ~2hrs.

**Assignments are due at 11.59PM on the scheduled due date (Usually the following Tuesday)

Course Outcomes:

- Apply the fundamentals of thermodynamics to biological systems
- Show how membranes and enzymes are involved in energy transformations in cells
- Illustrate how organisms acquire and transform solar energy into the potential bond energy of organic molecules how organisms transform the potential bond energy of complex organic molecules into usable forms (ATP, NADH, etc.)
- Analyze how organisms differ in the way energy is used for resting and active metabolism
- Differentiate how organisms invest energy into reproduction and how their population size may change over time
- Demonstrate the flow of energy and cycling of nutrients through ecosystems
- Collaborate with peers to describe, design and carry out scientific experiments
- Analyze scientific data collected from scientific experiments (student-conducted experiments and experiments described in the primary literature)
- Produce oral and written reports that communicate scientific information effectively

Electronically Approved - May 03 2021 14:12

Department Approval