



CAMOSUN COLLEGE
School of Arts & Science
Department of Biology

BIOL-231-D01AB
Principles of Cell Biology
Fall 2020

COURSE OUTLINE

The course description is online @ <http://camosun.ca/learn/calendar/current/web/biol.html>

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

(a) Instructor	<u>Dr. Larry Anthony</u>
(b) Drop-In Virtual Office Hours	<u>Tuesday and Thursday 10:00-10:50; Friday 12:00-12:50</u>
(c) Location	<u>Online (D2L Collaborate)</u>
(d) Phone	<u>N/A</u> Alternative: <u>N/A</u>
(e) E-mail	<u>anthonyl@camosun.bc.ca</u>
(f) Website	<u>http://online.camosun.ca/ (D2L)</u>

IMPORTANT NOTE: During the ongoing COVID-19 pandemic, my 'office' hours will be virtual and held electronically, using Blackboard Collaborate Ultra (BBCU) and accessed through D2L. At the times listed, I will open a meeting and wait for students to sign in and visit me there. I understand that these scheduled, virtual 'drop-in office hour' times will not necessarily align with everyone's class schedules. This should not deter you from trying to visit me in my virtual office! My schedule will be posted on the course D2L website: **I CAN BE AVAILABLE AT ALMOST ANY TIME THAT I'M NOT ALREADY ENGAGED IN TEACHING.** Simply arrange an appointment **BY E-MAIL** and I'll be very pleased to open a BBCU session to meet with you at a mutually convenient time.

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Describe the properties of the four groups of macromolecules, including how polymers are synthesised from monomeric units.
2. Describe the structure and functions of the subcellular compartments, organelles and structural molecules.
3. Describe the molecular structure of cellular membranes and explain how membrane structure facilitates membrane function.
4. Explain the molecular mechanisms underlying diffusion, facilitated diffusion and active transport across cytoplasmic membranes.
5. Describe how cells interact with their environment through the extracellular matrix and with other cells through intercellular junctions.

6. Describe the structure and functions of the intracellular membrane systems. Explain the cellular and molecular mechanisms underlying the flow of molecules through the endomembrane system.
7. Explain how secretion, endocytosis and exocytosis facilitate the bulk movement of molecules into and out of the cell.
8. Explain the cellular and molecular mechanisms underlying communication between neurons.
9. Explain the cellular and molecular mechanisms through which cells communicate with one another by chemical messengers.
10. Describe the structures of the cytoskeleton. Explain how the cytoskeletal components are used in movement of intracellular components and in cell motility in the environment.
11. Describe the cellular and molecular mechanisms underlying control of the cell cycle and programmed cell death. Apply these principles in the dysregulated environment of cancer cells.
12. Conduct complex experiments and use a variety of current molecular and analytical techniques to assess various aspects of cellular biology. Critically evaluate data and present written laboratory reports.

3. Required Materials

Text: Hardin & Bertoni (2016) *Becker's World of the Cell*, 9th Edition (Pearson). The textbook may be purchased online from the Camosun Bookstore. Alternatively, the publisher has made an online e-text available for purchase. Details are available on the course D2L website.

Unit 2 Text: Prepared by Larry Anthony (downloadable from D2L)

Brain-Based Learning A document entitled *Learning to Learn WITH the Brain, NOT AGAINST It* (downloadable from D2L) will provide effective learning strategies

Lab Manual: Biology 231 lab outlines will be posted on the Biology 231 D2L website several days prior to the lab times. You will be responsible for reading the outline (and any associated worksheet materials) before the lab session. You will also be responsible for following any pre-lab instructions that may be indicated in the lab. Knowledge of lab procedures and principles prior to the lab may be evaluated through pre-lab quizzes.

Lab Coat: Lab coats are NOT required for virtual lab work.

Lecture Outlines: Lectures will be delivered in a PowerPoint format. Copies of slides will be made available on the Biology 231 D2L website. These may be used at the student's discretion.

4. Course Content and Schedule

Lectures:	Tue	08:30–09:50	Online (D2L Collaborate)
	Fri	10:30–11:50	Online (D2L Collaborate)
Lab:	Wed	09:30–12:20	Online (D2L Collaborate)
Lab:	Wed	13:30–16:20	Online (D2L Collaborate)

NOTE: See last page for the anticipated weekly breakdown of scheduled lecture and topics. Note that times and topics are subject to change.

5. Basis of Student Assessment (Weighting)

ONE of the following grading options will apply:

Lecture Midterm 1	15
Lecture Midterm 2	20
Lecture Quizzes	2%
Lab Exam 1	11%
Lab Exam 2	11%
Lecture Final Exam	25%
Assignments / Labs	16%
TOTAL	100%

6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

Larry Anthony has prepared a document intended to provide insight into effective (and ineffective) ways of studying. This document will be posted on the course D2L website.

8. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @

<http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>.

Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment,

Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

See below for how some of these policies are applied in the lecture and lab of BIOL-231.

A. Grading Systems <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	Incomplete: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	In progress: A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	Compulsory Withdrawal: A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

ATTENDANCE

Even though lectures and labs will take place in an online environment, they have been scheduled synchronously at specific time slots during the week (see details in Section 1, above) in order to avoid conflicts with other courses. The best learning experience occurs when the student is actively engaged in real time, when they can ask questions and participate in class activities and discussions. Therefore, it is expected that students will attend all lecture and lab sessions that take place on the Blackboard Collaborate Ultra (BBCU) platform accessed through D2L. It is understood that it may be necessary for a student to miss the occasional lecture. **As long as class attendance remains high**, the lectures will be recorded for review at a later time. Lab attendance is mandatory and will be noted each lab period. Lab sessions will start promptly (after a five-minute grace period) and late attendance may result in inability to attend the lab and subsequent loss of credit for any assignments. Lateness in arriving, unexcused failure to attend the lab or unexcused departure from the lab before its scheduled finish time will result in forfeiting credit for any written assignments for that lab.

ACADEMIC HONESTY AND ACADEMIC MISCONDUCT

In addition to the [College Student Conduct Policy](#), the School of Arts and Science has [Guidelines](#) for faculty to interpret and apply this [Policy](#). The [Guidelines](#) require the instructor to report all instances of academic dishonesty to the School. The [Guidelines](#) also prescribe penalties for infractions. All learners in BIOL-231 are bound by **BOTH** the College [Policy](#) **AND** the School [Guidelines](#), so be sure to familiarise yourself with them. **WITHOUT EXCEPTION**, violations of the School academic honesty [Guidelines](#) will be reported to the School, regardless of the level of infraction. The School will make a notation of the infraction.

The [Arts & Science Academic Honesty Guidelines](#) outline the types of behaviour that constitute academic dishonesty. Although **ALL** types of dishonesty described will apply without exception, two of them are worth highlighting for BIOL-231.

STUDENT SAFETY

NOTHING is more important to the instructor than students enjoying a safe class and lab environment. In 2020F, physical safety in the lab is not relevant because all our instruction is purely remote during the COVID-19 pandemic. However, the online nature of our course exposes a risk of online harassment and other forms of anti-social behaviour. Therefore, personal and emotional safety is another dimension of safety and respect that will be strictly enforced whilst we learn together in an online environment. Treating other students with disrespect or harassment will be regarded as academic misconduct that will not be tolerated and will be penalised. We must regard ourselves as the professionals we one day aspire to be, and treat each other in a considerate, professional manner.

CHEATING

A student caught using "any unauthorised material or information in order to complete an assignment, exam or project" will forfeit all credit for that assignment or exam, and perhaps for the course. **ALL** examples in the [Arts & Science Academic Honesty Guidelines](#) apply to BIOL-231, but the following are worth noting:

- (a) using **ANY** unauthorised materials or resources in a quiz/exam;
- (b) allowing others to copy or otherwise use your work;
- (c) providing information to another person regarding exam content.

To be clear, during quizzes and exams, there will be **NO** materials or resources permitted. Unauthorised materials include internet web sites, any resources on, or downloaded from, D2L, e-mail communications, conversations with other people. Essentially, **if you are not permitted a resource in a normal, in-person assessment that takes place in a classroom, then you are not permitted those resources in an online assessment**. Considering the potential for academic dishonesty in writing exams in an online

environment, the instructor will be especially diligent in monitoring for evidence of dishonesty. It is remarkably easy to distinguish exam answers that have been written with any unauthorised external aid. If assessment answers appear to be arrived at dishonestly, **NO MARKS** will be awarded, and the entire exam may be assigned a **ZERO** grade. Violations will be reported to the Arts & Science office.

PLAGIARISM

Plagiarizing is appropriating the work or parts or passages of another's writing, *including the ideas or language*, and passing them off as the product of one's own mind or manual skill. Plagiarism is an important subset of academic dishonesty and will not be tolerated. **ALL** examples in the [Guidelines](#) apply to BIOL-231, but the following is worth noting: except where work is assigned to a group, all written work, **including lab data processing and graphing**, must be done individually, with no input from anyone, including lab group members.

IMPORTANT NOTE:

In the [Arts & Science Academic Honesty Guidelines](#), reference is made to "intentional or knowing use". Since the [Policy](#), the [Guidelines](#) and this course outline have stated clearly that cheating and plagiarism is not permitted, there is **no circumstance** in which an infraction in BIOL-231 will be considered unintentional or unknowing. All infractions will be assigned 0 marks and the infraction reported to the Arts & Science office.

EXAMS AND QUIZZES

GENERAL CONSIDERATIONS

All exams and other assessments will be written electronically on the D2L platform. The days of exams and quizzes are noted in the course schedule at the end of this document. Students are required to ensure their personal schedules allow them to be present at the scheduled times. Accommodation will be made for emergency absences, but only if the instructor is notified **BEFORE** the exam. Since the pace of content delivery in lectures is so quick, it is important not to fall behind. Therefore, it is not in students' best interests to defer a lecture exam.

1. Emergency accommodation of lecture midterm exams will consist of transferring the percentage weight of the midterm to the final. This is feasible because the final exam is cumulative, covering content from the entire course.
2. Emergency accommodation of the lecture final exam will consist of deferring the final exam to a later date **within the final exam period**. In very extraordinary cases, a deferred final exam cannot be written in the final exam period. In such cases an 'I' grade (incomplete) will be recorded until the final exam can be completed.

IMPORTANT NOTES:

1. Emergency accommodation is **NOT** automatic; accommodate is at the discretion of the instructor. **NO** accommodation will be offered unless the instructor is notified **BEFORE** the exam time.
2. Once any quiz or exam is written, there will be **NO** opportunity to write a makeup exam, and there will be **NO** opportunity re-weight the final exam.

****** HOLIDAYS OR SCHEDULED FLIGHTS ARE NOT CONSIDERED TO BE EMERGENCIES, AND WILL NOT BE ACCEPTED AS REASONS TO DEFER OR RE-SCHEDULE EXAMS. ******

Be sure **NOT** to make travel plans for the middle or the end of the semester until the lecture and lab exam schedules are posted. **Important:** please ask any friends or family members who might make travel plans on your behalf to consult you before booking non-refundable tickets.

WRITTEN WORK

Lecture and lab assignments will be assigned at the instructor's discretion. ***It is the student's responsibility to be informed of any work expected and the dates the work is due.*** Assignments may be intended to be completed as individuals or as groups. The instructor will make clear which is which. Work intended to be submitted by an individual **MUST BE** completed independently. It is tempting to work with a friend on an assignment, but this violates the intent of the individual assignment. If cooperation on an individual assignment is suspected, the academic honesty penalties will be applied as described above.

Work intended for completion by a group **MUST NOT** be completed by an individual. Each person in a group will receive the same mark on any group work. If a group member does not contribute in an equal manner to a group assignment, then that person's name **MUST NOT** be included on the assignment; this is academic dishonesty.

To be clear, if individual assignments **FAIL IN ANY WAY** to reflect an entirely individual effort, this will be regarded as an infraction under the [Guidelines](#) that will be penalised and reported to the School.

Without exception, ALL written material submitted must be prepared using MS Word, MS Excel and/or MS PowerPoint. Because the formatting of written work is very important, submissions prepared with Open Office, or any other software package, will **NOT** be accepted. For your convenience, this software is included in the Office 365 package that is made available to Camosun students **at no charge**. Office 365 may be accessed online or downloaded and installed on up to five devices (recommended). You may access Office 365 by going to the student sign-up link on the following web page: <http://camosun.ca/services/its/other-services.html>. Work submitted inappropriately formatted will not be marked and a late penalty will be applied (see below).

MS Word and Excel templates will be posted on the course D2L website for assignment purposes; these templates must not be altered except to complete the blank areas. All written work must be submitted as an attachment to an e-mail. **Always be on the lookout for special instructions.**

LATE PENALTIES

All assignments must be handed in on the **correct date**, and by the **time indicated**, on the assignment. Late assignments that are correctly formatted will be graded, but marks equivalent to 15% of the total value of the assignment will be deducted for each day past the deadline (weekends count as one day). If the format is inappropriate, then an additional late penalty of **at least** one day will be applied and the assignment will not be marked until the formatting is acceptable (see above).

SUMMARY OF STUDENT RESPONSIBILITIES

1. Students will be considerate and respectful to others in the class.
2. Attending classes and actively engaging in lecture times are optimal for learning and therefore are in the best interests of student success. Should it be necessary to miss a lecture, however, it is the student's responsibility to catch up on anything that may have been missed (e.g. important announcement or assignments).
3. Students must hand in required assignments on time or be subject to penalty.
4. Electronic submissions of assignments is **mandatory**.
5. Attendance is mandatory for all laboratories, and labs will start punctually.
6. Evaluation of written or oral lab work will not be given if a student is not present for the lab.
7. Students must work independently, except when a group effort is required.

**Biology 231 – 2020F – Course Schedule (Note: Scheduled dates and specific topics are subject to change)
Topics may be added or deleted or adjusted in length depending upon time constraints or availability.**

Wk	Day	Date	Unit	Lecture Topic	Chap	Lab	Lab Activity
1	Tue	8-Sep		Course Introduction			
1	Wed	9-Sep				1	Lab Data Processing
1	Fri	11-Sep	1, 2	Inflammation & Cellular Structure			
2	Tue	15-Sep	3	Biological Molecules	2/3		
2	Wed	16-Sep				2	Microscopy
2	Fri	18-Sep	3	(QUIZ 1) Biological Molecules	2/3		
3	Tue	22-Sep	4	Membrane Functional Anatomy	7		
3	Wed	23-Sep				3	Histology
3	Fri	25-Sep	4	Membrane Functional Anatomy	7		
4	Tue	29-Sep	5	Membrane Transport	8		
4	Wed	30-Sep				4	Diffusion
4	Fri	2-Oct	5	(QUIZ 2) Membrane Transport	8		
5	Tue	6-Oct	5	Membrane Transport	8		
5	Wed	7-Oct				5A	Cell Culture (Wk1)
5	Fri	9-Oct	6	Cytoskeleton Structure & Function	13		
6	Tue	13-Oct		LECTURE MIDTERM 1			
6	Wed	14-Oct				6	Leukocyte Isolation
6	Fri	16-Oct	6	Cytoskeleton Structure & Function	13		
7	Tue	20-Oct	6	Cytoskeleton Structure & Function	13		
7	Wed	21-Oct					LAB EXAM 1
7	Fri	23-Oct	7	Cell Motility	14		
8	Tue	27-Oct	7	Cell Motility	14	7	RBC Protein Isolation & Assay
8	Wed	28-Oct					
8	Fri	30-Oct	8	Cell Adhesion, Junctions & ECM	14		
9	Tue	3-Nov	8	Cell Adhesion, Junctions & ECM	14		
9	Wed	4-Nov				8	Protein SDS-PAGE Analysis
9	Fri	6-Nov	8	Cell Adhesion, Junctions & ECM	14	5B	Cell Culture (Wk 2)
10	Tue	10-Nov	9	Chemical Signal Transduction	23		
10	Wed	11-Nov					REMEMBRANCE DAY - NO LAB
10	Fri	13-Nov	9	Chemical Signal Transduction	23		
11	Tue	17-Nov		LECTURE MIDTERM 2			
11	Wed	18-Nov				9	RTK Signaling
11	Fri	20-Nov	11	Electrical Signaling in Neurons	22/12		
12	Tue	24-Nov					
12	Wed	25-Nov	11	Electrical Signaling in Neurons	22/12		TUTORIAL
12	Fri	27-Nov	10A	Cell Cycle	24/26		
13	Tue	1-Dec	10B	Cell Death	24/26		
13	Wed	2-Dec					LAB EXAM 2
13	Fri	4-Dec	10C	Cancer	24/26		
14	Tue	8-Dec	12	Endomembrane System	12		
14	Wed	9-Dec				10	Phagocytosis
14	Fri	11-Dec	12	Endomembrane System	12		
	Mon	14-Dec		FINAL EXAM PERIOD BEGINS			

TEXTBOOK READINGS

Unit	Topic	Chapter	Pages
1	Inflammation: Cell Biology in a Nutshell	N/A	PPT on D2L
2	Cellular & Sub-Cellular Structure	N/A	Chapter provided on D2L
3	Biological Molecules	2 / 3	24–25; 32–38; 42–67; 70–71
4	Membrane Functional Anatomy	3 / 7	67–70; 152–154; 157–171; 175–180
5	Membrane Transport Mechanisms	8	185–211
6	Cytoskeleton Structure & Function	13	351–375
7	Cell Motility	14	377–387; 388–397; 399–402
8	Cell Adhesion, Junctions & Extracellular Matrix	15	405–424
9	Chemical Signal Transduction	23	684–686; 689–701
10	Cell Cycle, Cell Death & Cancer	24 / 26	714–718; 730–743 (+ PPT); 791–799
11	Electrical Signaling in Neurons	22 / 12	658–681; 338–340
12	Endomembrane System	12	314–323 (+PPT)

NOTES:

1. The pages listed are from the 9th edition of Hardin & Bertoni "*Becker's World of the Cell*". Other editions may describe similar concepts, but the page numbers will be different.
2. Unit 1 (Inflammation) is not covered in the text book. Refer to PowerPoint (PPT) slides posted on the D2L website.
3. Unit 2 (Cellular and Sub-Cellular Structure) is covered in "Unit 02 Cellular & Sub-Cellular Structure", a chapter written by Larry Anthony, based upon Chapter 4 in *Becker's World of the Cell*. This chapter will be posted on the course D2L website.