CAMOSUN COLLEGE
School of Arts & Science
Department of Biology

BIOL-231-D01
Principles of Cell Biology
Winter 2021

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	Dr. Kate Pettem		
(b) Office hours	Wed. 9 – 11 am; Thurs. 10 – 10:30 am; Fri. 9-11 am		
(c) Location	Online (D2L Collaborate)		
(d) Phone	N/A	**Alternative:**	
(e) E-mail	pettemk@camosun.ca		
(f) Website	https://online.camosun.ca/d2l/home		

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 synthesized 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

Recommended Text: Recommended 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.

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.

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

Labs: Asynchronous: to be done at any time during the assigned week(s)

Lectures: Tues. 10:00 – 11:20 am
Thurs. 08:30 – 09:50 am

Additional Information: Course Content and Schedule

I. Office Hours and Synchronous Activity

- Each week, we will have two scheduled "live" lectures on Collaborate. Attendance is optional, but highly encouraged as it gives students the opportunity to ask live questions and participate in discussions about the course content. The lectures will also be recorded and posted on D2L under each week's module for later viewing and review. There will be specific content reviewed during these sessions, and they are also great time to ask questions about the week's module and lab activities. It is the student's responsibility to attend live and/or review the recording; Office hours are not a substitute for reviewing material covered within the recorded lectures.
- Office hours will be held by appointment for 1-on-1 or small group Collaborate sessions (15 -20 min blocks) during the following times:
    - Wednesdays 9 am – 11 am
    - Thursdays: 10 am – 10:30 am
    - Thursday: 9 am – 11 am

  Please email pettemk@camosun.ca to set up an appointment.

II. Lecture Content

- The "lecture" portion of the course is divided into 11 modules. The content for each module consists of a course notes package (in PowerPoint format). In the section for each module, you will also see a "Study Objectives" document; these are the essential points and skills you are expected to acquire and that you will be tested on.
- Each module has an accompanying review assignment. These assignments are open for the week that we cover the module. You have 2 attempts for each assignment. If you make only 1 attempt, this is what will reflect as your mark for that assignment within D2L. If you make 2 attempts, D2L will instead calculate the average of both those attempts. Once the deadline passes, submissions can no longer be made through D2L and **will automatically be marked as zero**. **NO LATE SUBMISSIONS ARE ACCEPTED** as the assignments are intended to keep you on track with the course material.
- Copies of all assignments can be found in the "Practice" section under Quizzes. These are only for review purposes and not for marks. You are allowed unlimited attempts. Each becomes available after the due date of the marked assignment.

- The PowerPoint notes are available once the course starts. However, the assignments only become available the week we cover that specific module.

III. Laboratory Content

- The laboratory portion of the course is a mix of virtual and at-home lab kits. For each lab, there are group exercises and assignments (completed at home, written in digital form, and submitted on D2L). Please see **Appendix A** below to see the schedule for labs (subject to change).
- The labs can be done in whatever way suits your group best. These labs have a written assignment portion, which are to be completed in your group as well (one assignment per group). Only a single submission is required for the entire group.
- Your lab group will be assigned randomly and remain constant for the full term.
- **GROUP WORK IS REQUIRED FOR THIS COURSE.** Should you not contribute sufficiently to your lab group assignments, your group is expected to omit your name from the group submission. In this case, you will receive a zero on the lab. You cannot complete group assignments alone.
- Written assignments will need to be prepared using Microsoft Word, and data processing is to be submitted using Microsoft Excel. See D2L for individual lab instructions.

IV. Exams

- The lecture midterm, the two lab exams and the final lecture exam will all be on D2L. They are open book format, timed (1.5 hours for midterms and lab exams; 3 hours for the final) and allowed ONE attempt each. The dates for each exam are listed in **Appendix A**; each exam will be available during the scheduled lecture time on the dates listed in **Appendix A**. You are expected to be available to write the exam during that time block. If you are a CAL student and need an accommodation of extra time for your exam, please contact your instructor at the beginning of the term to arrange for this **before you write you exam**.
- Should an emergency or issue arise that prevents you from completing an exam at the scheduled time, you are required to contact your instructor ASAP and **before** the noted scheduled time for approval to arrange for a deferred exam date or re-weighting of your final exam. Failure to obtain prior approval will result in the exam being automatically marked zero in D2L. No re-writes are allowed once an exam has been started or attempted.
- Study guides for each exam will be available on D2L closer to the exam dates.

V. Course Schedule

- Note on Dates: New lecture and lab assignments start each Monday at 11:59pm and are available until the following Monday at 11:59pm, unless otherwise posted.. All deadlines appear in the D2L Calendar tool.

5. Basis of Student Assessment (Weighting)

Lecture Assignments:	15%
Lab Assignments:	15%
Lecture Midterm:	15%
Lab Exam 1:	15%
Lab Exam 2:	15%
Final Lecture Exam:	25%

6. Grading System

[X] Standard Grading System (GPA)

☐ Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course – N/A

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, Student Ancillary Fees, Academic Integrity, Grade Review & Appeals, Student Misconduct and Academic Accommodations for Students with Disabilities and Student Penalties and Fines.

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.

APPENDIX A: BIOLOGY 231 WINTER 2021 COURSE SCHEDULE

WEEK #	START DATE	DUE DATE	LECTURE UNIT	TEXTBOOK CHAPTER(S)	LAB
1	Jan. 11	Jan. 18	1: Biological Molecules	2/3	
2	Jan. 18	Jan. 25	2: Cellular Structure	4	1: Microscopy
3	Jan. 25	Feb. 1	3: Membrane Functional Anatomy	7	2: Histology
4	Feb. 1	Feb. 8	4: Membrane Transport Mechanisms	8	3: Cell Culture
5	Feb. 8	Feb. 22	5: Cytoskeleton Structure & Function	13	4: Leukocyte Isolation
6	Feb. 15	**READING BREAK – NO CLASSES OR LABS**			
7	Feb. 22	Mar. 1	6: Microtubule-Based Intracellular Motility; Propulsive Motility; Myosin & Muscle Cell Motility	14	**LAB EXAM 1 – THURS. FEB. 25**
8	Mar. 1	Mar. 8	**MIDTERM LECTURE EXAM – THURS. MAR. 4**		5: Diffusion
9	Mar. 8	Mar. 15	7: Cell Adhesions; Intercellular Junctions; Extracellular Matrix	15	6: RBC Protein Isolation & Assay
10	Mar. 15	Mar. 22	8: Chemical Signal Transduction	23	7: Protein SDS-PAGE Analysis
11	Mar. 22	Mar. 29	9: Cell Cycle Control; Cell Death, Cancer	24/26	8: SimBio Action Potentials
12	Mar. 29	Apr. 5	10: Electrical Signaling: Resting Membrane Potential, Action Potential	22	Tutorial
13	Apr. 5	Apr. 12	11: Endomembrane (SER, RER, Golgi)	12	**LAB EXAM 2 – THURS. APR. 8**
14	Apr. 12	Apr. 19	TBD / Content Review		9: RTK Signaling
	Apr. 19 - 27		**FINAL LECTURE EXAM –** (Exam Date TBA)		