BIOL 225 A01/A02 (CRN 10364/10365)
Principles of Cell Biology
Fall 2023

Instructors:

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Territorial Acknowledgement:

We acknowledge and respect the lkʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

Inclusivity Statement:

We consider our classroom and office hours to be a place where you will

A01: TWF 10:30 ï 11:20, Bob Wright Centre B

Lecture Recordings: audio recordings will be available for most lectures.

Textbook Chapter Problems: practice problems from the textbook publisher.

Quizzes and Exams: this will be split into sections for the the Academic Integrity Quiz, Exit Competency Quiz, topic quizzes, midterms and final exam. Online quizzes and midterms will be located here. Midterm and final exam sections will also include practice problems.

Academic Intergrity Quiz: you must score 100% on this quiz before you will be allowed to write any Participation Quizzes or Midterms. This can be found in the Quizzes and Exams section.

Laboratory Materials: these can be found on the laboratory Brightspace site
Note: Laboratory sessions start during the week of September 11th.

Required Materials

Textbook: Beckerôs World of the Cell, Tenth Edition, Hardin and Lodolce. *Pearson*, Boston, 2022.

Topics:

	topic	chapters
1	INTRODUCTION - introduction to cell biology	1, 4
2	BIOMOLECULES - cell chemistry and biomolecules	2, 3, 7, 8
3	ORGANELLES - cells and organelles	4,10,11
4	MEMBRANE SYSTEMS cytoplasmic membrane systems	12
5	SYNAPTIC SIGNALLING	22
6	CELL SIGNALLING (non-neuronal)	23
7	CYTOSKELETON	13, 14, 15
8	CANCER	24, 26

Learning Objectives

Topic 1a ±Discovery of Cell, a history

LEARNING OBJECTIVES: early experiments surrounding the discovBT/F4 12 T5.25 3ID 60Cell, a h inm

knowledge to decide which type of microscopy will be best suited to a particular application.
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Topic 1c - Cell Culture
LEARNING OBJECTIVES: students will be introduced to the historical figures and early experiments performed in the development of cell culture techniques. They will have an understanding of challenges surrounding the culturing of animal cells. Students will also learn to recognize the advantages and disadvantages of working with animal cells in culture.

TOPIC 2: Cell Chemistry and Biomolecules

LEARNING OBJECTIVES: in this topic, the building blocks of the cells will be introduced. Students will be expected to how these blocks are assembled into functional macromolecules. This will include analysis of the different types of chemical bonds holding molecules together. Membrane composition and function will be explored, and students will be expected to understand how membranes serve as permeability barriers that demarcate the cell. They will also understand the energetic forces associated with concentration gradients that form across a membrane. Finally, transport of impermeable molecules across a membrane will be discussed, and students will be expected to understand the basic mechanism of these transporters as well as their energetic requirements.

TOPIC 3: Cells and Organelles

LEARNING OBJECTIVES: In this section, students will be introduced to the main functions of the organelles. Students will be expected to know the major functions of each organelle, and understand the adaptations each organelle has gained to maximize their ability to carry out these functions.

TOPIC 4: Membrane Systems

LEARNING OBJECTIVES: movement between organelles, or between organelles and the exterior of the cell, is often mediated by vesicles. The importance and significance of vesicular trafficking, as well as the mechanism, will be described in this section.

TOPIC 5: Signalling 1 ±Synaptic Signalling

LEARNING OBJECTIVES: in this section, we will describe how impermeability of the cell membrane to ions allows membrane potential to be established. Students will be expected to know how the various ion channels contribute to an action potential by manipulating the permeability of ions.

TOPIC 6: Signalling II ±Non-neuronal Signalling

Final Exam:

The final will be held in person. It is a cumulative exam. You will be allowed to bring a two-sided templated reference sheet (template will be provided prior to the exam). The date and time of the exam will be determined by the Registrar.

EVALUATION	Date
40% laboratory ***	***based on laboratory components. See lab manual for grading details***
4% Topic Quizzes	***0.25% participation mark for each of 8 quizzes (must get at least one answer correct). See due dates and times above.***
10% Midterm 1	***Online via Brightspace, Wed., October 04. Exam. There will be no lecture on this date. See midterm details above.***
10% Midterm 2	***Online via Brightspace, Wed., November 01. There will be no lecture on this date. See midterm details above.***
36% final exam	***2 hours, in person cumulative exam, date and time TBD by the Registrar***

****** since the course includes lab work, you are required to achieve satisfactory standing in both parts of the course and thus Åyou will not be permitted to write the final exam and will not receive credit for the course if you fail the laboratory component of the course.***

Conversion of marks to final letter grades:

The total mark, calculated from the marks on all of the exams according to the

COURSE INFORMATION AND POLICIES

1. The Department of Biology upholds and enforces the University's policies on

courses will be arranged by the instructor. Deferred final exams or spring term courses will be arranged through Undergraduate Records and must be written before