



School of Arts & Science  
BIOLOGY DEPARTMENT  
BIOL 230  
Cell Biology  
Winter 2014 (Jan-Apr)

## COURSE OUTLINE

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

⚡ Please note: the College electronically stores this outline for five (5) years only.  
It is **strongly recommended** you keep a copy of this outline with your academic records.  
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

### 1. Instructor Information

Instructor:	Sarah Cockburn		
Office Hours:	Mon	1:00 PM – 2:20 PM	
	Tue	9:30 AM – 10:50 AM	
	Thurs	10:00 AM – 10:50 AM	
Location:	F352		
Phone:	250-370-3925		
Email:	cockburns@camosun.bc.ca		
Website:	<a href="http://online.camosun.ca/">http://online.camosun.ca/</a> (D2L entry site)		

**IMPORTANT NOTE:** If my office hours do not match up with your schedule, this should not dissuade you from coming to see me! If you would like to meet to discuss anything pertaining to the course *not* during my scheduled office hours, simply arrange an appointment by e-mail (cockburns@camosun.bc.ca) and I will be very pleased 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 monomeric components, synthesis and properties of the polymer for each of the four groups of macromolecule.
2. Examine the molecular structure of cellular membranes. Discuss the roles of active and passive transport mechanisms in the movement of molecules across cellular membranes.
3. Classify and describe the structural and adhesive proteins of the extracellular matrix. Described the structure and function of the major types of cell junction. Discuss the roles of the extracellular matrix and cell junctions in cell-cell recognition, communication and adhesion.
4. Explain the structural organization of DNA and chromosomes in the nucleus. Describe the structure and function of the nuclear matrix and lamina. Discuss passive and active transport of molecules through nuclear pores.
5. Demonstrate knowledge of the molecular mechanism of eukaryotic DNA replication. Understand the events associated with, and the molecular basis of, regulation of the cell cycle. Discuss how abnormalities in cell cycle regulation contribute to the development of cancer.
6. Discuss the principles of eukaryotic transcription, RNA processing and RNA surveillance. Explain the events associated with translation, polypeptide folding, post-translational processing and protein targeting and sorting.
7. Discuss the role of the smooth endoplasmic reticulum in drug detoxification, carbohydrate metabolism, and calcium storage. Described the flow of molecules through the endomembrane system. Explain the roles of the rough endoplasmic reticulum and the Golgi complex in glycosylation and protein sorting.
8. Describe, at the molecular level, the means by which G protein-linked and protein-kinase associated receptors activate signal transduction pathways within the cell. Discuss the molecular mechanisms of induction and regulation of apoptosis.
9. Describe and differentiate among the major structural elements of the cytoskeleton. Discuss the role of the cytoskeleton in cell movement, division and positioning and movement of organelles.
10. 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

Becker, Kleinsmith, Hardin & Bertoni (2012) *The World of the Cell*, 8<sup>th</sup> Edition (Benjamin Cummings)

#### Lab Manual

Biology 230 lab outlines will be posted on the Biology 230 D2L website several days prior to the lab times. You will be responsible for printing the outline (and any associated worksheet materials) and reading it 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.

#### Lecture Outlines

Lectures will be delivered in a PowerPoint format. PowerPoint slides will be made available on the Biology 230 D2L website. These may be used or printed at the student's discretion to help follow the lectures.

### 4. Course Content and Schedule

#### Class Schedule:

**Lectures:** Mon 11:30 AM – 12:20 PM  
Tue 11:30 AM – 12:20 PM  
Thur 11:30 AM – 12:20 PM

**Lab Section A:** Thur 1:30 PM – 4:30 PM  
**Lab Section B:** Fri 9:30 AM – 12:30 PM

**Course Content:** See Last Page

### 5. Basis of Student Assessment (Weighting)

#### LECTURE: 61%

Lecture Quiz 1-5 16%  
Midterm 20%  
Final Lecture Exam 25%

#### LAB: 25%

Lab Exam I 10%  
Lab Exam II 15%

#### LAB/LECTURE 14%

Assignments / Labs / Quizzes/ Participation 14%

### 6. Grading System

#### 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	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

#### 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 E-1.5 at [camosun.ca](http://camosun.ca) for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> 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	<i>In progress:</i> A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 <sup>rd</sup> course attempt or at the point of course completion.)
CW	<i>Compulsory Withdrawal:</i> 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.

## 7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at [camosun.ca](http://camosun.ca).

### STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services, and the College web site in the Policy Section.

#### Plagiarism

Plagiarizing is appropriating the work of another 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 will not be tolerated.** Plagiarism, **including the copying of any part of assignments or lab assignments**, is a serious offence and is considered to be academic misconduct. In some cases, the lab instructor may prefer a lab assignment to be written as a group. In such cases, handing in one assignment for the group will be acceptable. Otherwise, lab assignments handed in by individuals are expected to be individually prepared.

#### Cheating

A student caught cheating on an exam will forfeit all credit for that exam and perhaps for the course. Cheating is a serious offence and is considered to be academic misconduct. **Cheating includes, but is not limited to, using unauthorized materials in a quiz/exam and providing information to another person regarding exam content.**

The consequences for cheating and plagiarism are outlined by Camosun College policies (see <http://camosun.ca/about/policies/education-academic/e-2-student-services-&-support/e-2.5.pdf> and <http://camosun.ca/about/policies/education-academic/e-2-student-services-&-support/e-2.5.1.pdf>) and may be severe.

## Lab Safety

The wearing of lab coats at all lab sessions is **absolutely mandatory** for both safety and professional reasons. Cloth coats are preferable but disposable ones are acceptable. If you forget your lab coat you may rent one at a cost of \$5. The money received through lab coat rental will NOT be used to line the (lab coat) pockets of the Biology 230 instructors. Rather, it will be donated to **Spread the Net**, an organization that supplies insecticide-impregnated bed nets to help prevent the spread of malaria in Africa. Lab coat use is restricted to the lab only: if you leave the lab, be sure to remove your lab coat and wash your hands.

Under **NO** circumstances will students ingest food or drink in the lab. Taking oral medication or applying makeup or lip balm in the lab is also prohibited. You may leave the lab at a convenient time if you are thirsty, need a snack or require medication.

For safety reasons students are **required** to wear closed shoes in all lab times. Flip flops, sandals or shoes with holes are not acceptable. The spirit of this is safety, so make sure your 'closed-toed' shoes are actually safe!

Failure to adhere to the lab safety principles will result in the inability to enter the lab, or expulsion from the lab, and the subsequent **loss of credit** for that lab, including any pre-lab assessment credit.

## Laboratory Attendance

The laboratory experience is critical to the course objectives and so attendance throughout the entire laboratory session is mandatory and will be noted. Failure to attend the lab, lateness in arriving or leaving the lab before its scheduled finish time will result in forfeiting credit for that lab, including any written assignments. If a lab session is missed, another student's data **may not** be used to complete a lab assignment for credit. Exceptions can be made **at the instructor's discretion** in legitimate cases of emergency (e.g. illness); in such cases the instructor must receive **advance notification** and **documented evidence** of the situation (e.g. medical certificate) and grant approval for any accommodation. In cases when a lab is done over two weeks, missing one of the weeks without instructor approval will result in a 50% reduction in the grade for any assignment associated with that lab.

## Missed Exams

Lab exams must be written at the scheduled times. Under no circumstances will a lab make-up exam be administered. However, it is understood that emergency circumstances occur (e.g. illness or emergency in the immediate family); for such circumstances accommodation may be offered at the discretion of the instructor, provided (a) the instructor is notified in advance of the exam (not after) and (b) the student provides documented evidence of the circumstance (i.e. medical certificate). Without exception, the accommodation will be in the form of adjusting the weighting of the final exam to make up the missing marks. In such cases, the final exam will include extra questions to examine knowledge of the untested subject matter.

For lecture quizzes, the top four (4) marks out of five (5) quizzes will be counted towards the 16% (4% each). Therefore, if one exam is missed for a medical or any other reason, the other four quizzes will automatically count towards the 16%. If a second quiz is missed for a documented medical reason or family emergency, the remaining three quizzes will be re-weighted to make up the 16%. Under no circumstances will make-up quizzes be administered.

**\* HOLIDAYS OR SCHEDULED FLIGHTS ARE NOT CONSIDERED TO BE EMERGENCIES \***

Be sure not to plan airline flights for the end of semester until the final exam schedules are finalized and posted.

## A Note about Lecture Quizzes and Participation:

- A) Lecture Quizzes: Lecture quizzes are designed to assess you at the same level of difficulty as you can expect to see on the midterm and final exam. They will consist of a handful of multiple-choice questions and one or two short answer questions. There are a number of quizzes to help you stay on track and monitor your progress / understanding of the course material. Quizzes will be at the START of lectures and will run for the first 15 minutes – followed by a lecture – so it is important that you are on time!
- B) In-class assignments / participation: these activities will take place during class and may require you to prepare or read before coming to class. Your mark will be based on your preparedness and participation during the activity. If you are absent on the day of an in-class activity (without a valid medical or emergency excuse) you will receive a zero for that activity. Content from in-class activities is also testable, so be sure to catch-up with a classmate if you do miss one.

## Late Penalties

All assignments must be handed in on the scheduled date **at the beginning of class**. Late assignments will be graded but marks equivalent to 15% of the total value of the assignment will be deducted per day past the deadline.

## Other Instructions

Unless otherwise indicated, all written material to hand in must be prepared using a word processor. Templates will be provided for this purpose, usually by posting on the course D2L website, in MS Word .doc or .docx format, and these templates should not be altered except to complete the blank areas. With few exceptions (at the instructor's discretion), all written work must be submitted in **hard copy**, not e-mailed or posted to the D2L website. This is for purely practical reasons: printing out many assignments is problematic because instructors use shared-access printers and documents or parts of documents can go missing easily. The due date for the assignment will be clearly indicated at the top of the page, and always be on the lookout for any special instructions. Finally, unless otherwise instructed, graphs must be prepared using software with graphing capability (e.g. Excel).

## Student Responsibilities

1. It is believed that attending and actively engaging in lecture times is 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).
2. Students are expected to hand in any required reports on time. Late assignments will be penalized (see above).
3. All written work (including numerical entries in data tables) is to be submitted in word processed form. The only exceptions are calculations or graphs, which may be submitted handwritten or hand-drawn. Electronic submissions (e.g. as e-mail attachments) will not be accepted, except where specified **by the instructor**. Failure to comply will result in late penalties (as indicated).
4. Examinations must be written as scheduled. Exceptions may be made for emergencies at the discretion of the instructor (see above). The student must notify the instructor in advance of the examination.
5. Any evaluation of work for in-class/lab assignments, reports and/or participation will not be given if a student is not present for any reason.
6. Students are expected to work independently on reports unless instructed that the evaluation is based on group effort and evaluation.
7. Students must know and follow all Safety Rules and Procedures. Students must sign the Safety Contract before participating in any laboratory activity. Failure to follow the Safety Rules and Procedures will result in penalties at the discretion of the instructor.
8. Eating or drinking is **strictly prohibited** and failure to comply may result in expulsion from the lab and loss of any associated lab credit. **No exceptions** will be tolerated.
9. **All students must wear a lab coat during laboratory sessions.** Failure to bring a lab coat to the lab may result in being unable to work in the lab and loss of credit for the lab.
10. Students must turn off cell phones and pagers during lectures and laboratory sessions.
11. All laboratories start punctually. Information necessary for performing the laboratory correctly and safely is given at the beginning of the lab. Late attendance may result in inability to attend the lab and subsequent loss of credit for any assignments.

**Biology 230**  W14  Course Schedule (Note: Scheduled dates are subject to change)

Topics may be added or deleted depending upon time constraints

Week	Date	Lecture Topic	Ch.	Laboratory Exercise
1	Jan 6 - 10	Macromolecules	3	1a - Microscopy
2	Jan 13 - 17	Macromolecules/ Membrane Structure / Function	3, 7	1b - Histology
3	Jan 20 - 24	<b>Quiz</b> Membrane Structure / Function Signal Transduction	7, 14	2 - Leukocyte isolation
4	Jan 27 - 31	Signal Transduction ECM; Cell Adhesion / Junctions	14, 17	3a - Cell Culture
5	Feb 3 - 7	<b>Quiz</b> ECM; Cell Adhesion / Junctions DNA / Nucleus	17,18	3b/4a - Cell Culture / Phagocytosis
6	Feb 10 - 14	DNA / Nucleus	18	<b>NO LAB</b>
<b>February 10 Family Day College closed, February 13 &amp; 14 Reading Break College Closed</b>				
7	Feb 17 - 21	<b>Quiz</b> DNA Replication, Cell cycle Regulation	19	4b/5 - RTK Signalling / Phagocytosis
8	Feb 24 - 28	<b>Midterm Exam</b> Cell cycle Regulation	19	<b>Lab Exam 1</b>
9	Mar 3 - 7	RNA Transcription / Processing	21	6a - G-Protein Signalling
10	Mar 10 - 14	<b>Quiz</b> Protein Translation / Sorting	22	6b - G-Protein Signalling
11	Mar 17 - 21	Regulation of Gene Expression	23	7 - Membrane Protein Isolation
12	Mar 24 - 28	Regulation of Gene Expression Apoptosis	23	8 - Membrane Protein Analysis
13	Mar 31 - Apr 4	<b>Quiz</b> Cancer Intracellular Compartments	14, 12	<b>NO LAB</b>
14	Apr 7 - 11	<b>Quiz</b> Intracellular Compartments	12	<b>Lab Exam 2</b>