BIOLOGY 186 – Physiology and Cell Biology, Online Edition

Department of Biology, University of Victoria

Spring 2021

Course description
This course, the companion course to Biology 184, focusses on functional aspects of organisms. Biochemistry, cellular components, membrane structure and function, energy transduction, DNA replication and gene expression. Insight into plant structure and response mechanisms of these light-eating organisms. Principles of animal physiology including homeostatic mechanisms, circulation, gas exchange, osmoregulation, thermoregulation, defense systems, chemical signaling, reproduction and development.

Course organization
We are making the course organization as similar as possible to Biology 184 in the fall.

Lecture sections
A01 – Monday and Thursday, 10:00 – 11:20 AM
A02 – Monday and Thursday, 1:00 – 2:20 PM
A03 – Monday and Thursday, 3:30 – 4:50 PM

The lectures in this course will be delivered asynchronously; see below for details. The lecture section times given above will have two uses:

- The first class, on Monday, January 11, will be synchronously delivered. It will involve no testable content, being only a brief introduction to the course and the people running it.
- Every Monday, we will be holding Live Learn / Q-and-A sessions on Zoom during the scheduled times for each section. These will not be mandatory.

Lecturers

- Dr. Greg Beaulieu
  Email: gregoryb@uvic.ca. If you send an email, please put "Biology 186" in the message line.
  Dr. Beaulieu will also be serving as the course coordinator, so if you have some business-related issue (except for lab business), he is the person to contact.

- Dr. Peter Constabel
  Email: cpc@uvic.ca. If you send an email, please put "Biology 186" in the message line.

- Dr. David Punzalan
  Email: davidpunzalan@uvic.ca. If you send an email, please put "Biology 186" in the message line.

- Kim Curry
  Email: cellbiol@uvic.ca. If you send an email, please put "Biology 186" in the message line.

Senior Laboratory Instructor
Alicia Rippington
Email: biologylabs@uvic.ca (for questions related to lab content). If you send an email, please put "Biology 186" and your lab section number (*e.g.* B03) in the message line.

Prerequisite
Any one of: Biology 11, Biology 12, Biology 150A, Biology 150B, Biology 184, or placement exam. You need not have passed Biology 184 in order to take Biology 186.

A course in chemistry at either the high school or university level is strongly recommended. If your chemistry is shaky, we recommend that you take Biology 186 later, this July-August if possible, after you have studied some chemistry.

Structure and scheduling of the course
The course has four elements.

1. Asynchronous Lectures – The lectures will be delivered in the form of narrated PowerPoint presentations or pre-recorded Zoom lectures that we will post on the course website on Brightspace. You will be able to watch them according to your own schedule. You will not need PowerPoint on your computer to view these. We will convert the PowerPoints to mp4 files that you can watch just by clicking on the title of the lecture.

Our plan is to post three lectures every Friday, each approximately 30-45 minutes.

2. Live Learn / Q-and-A with the lecturers
There are three ways we will be able to answer your questions. Each lecturer will let you know which format they prefer.

- First, the Brightspace site has a forum allowing students to post questions that the lecturer can read and answer. Both the questions and the answers will be publicly available to the whole class at any time, a valuable feature, because several students might be wondering about the same issue.

- Second, we will have synchronous Live Learn / Zoom Q-and-A sessions. These sessions will take place on Zoom at times the university has scheduled for each Monday for lectures.
  A01 – Monday, 10:00 – 11:20 AM
  A02 – Monday, 1:00 – 2:20 PM
  A03 – Monday, 3:30 – 4:50 PM

  Attendance at these sessions will not be mandatory. They will not be recorded, so the questions and answers will not be available to students who have not attended the session.

  Please note that Monday, February 15 to Friday, February 19 is Reading Break, so there will be no Zoom sessions on that Monday.

- Third, you can email us directly with your questions or schedule a personal Zoom appointment. This would be appropriate if you have something personal or confidential to discuss.

3. Synchronous Labs – Labs are an important part of Biology. See the information about labs, below.

4. Online Exams – see the information about the online exams, below.

Required text
Campbell Biology, third Canadian edition, by Urry *et al.* 2021. Available through the bookstore. You can purchase either a hardcopy or e-text version. This is the same text as was used in Biology 184 in the fall.

If you have access to the previous edition of the text (second Canadian edition), that will be alright for you to use, but bear in mind that some of the pagination, figure numbers and problem numbers might be different.

New copies of the text come with access to the publisher's website, Mastering Biology, plus the etext. Some students find this access useful, but we do not require access in this course. If you are using the second Canadian edition of the text, which does not come with website access, you will not have to purchase website access to do well in this course.

If you buy a new book, or if you buy the etext + Mastering Biology, you will need a course ID and other information about accessing the Pearson website. Please see the sheet of instructions that we have posted for you on Brightspace under 'Course Business'.

Labs
Labs begin the week of Monday, January 18. There is no lab manual; instructions for each lab will be posted on Brightspace.

The laboratory portion of the course is worth 45% of your final grade. You must pass the lab in order to pass the course.

Attendance in the synchronous laboratory sessions is mandatory. If you miss more than two labs for any reason, even with a medical excuse, you will receive a failing grade (F) in the course.

Brightspace website
Biology 186 has a Brightspace website. There you will find course information, lecture notes, pre-recorded lectures, lab notices lab information, test results, practice questions, exam information, the exams themselves, and links.

Evaluation

The lecture portion of the course is worth 55% of your final grade. The lecture exams will not be cumulative. They will be open on Brightspace from 8:30 AM to 8:30 PM on the days stated, but you will have your own personal clock; see below for timings on this clock.

The exams will be open book. However, you may not consult anyone else, either in this course or outside it, to help you with your attempt. We ask, on the honour system, that you observe this rule.

- Midterm 1, Thursday, February 11

Greg's topics 18% of course grade
40 multiple choice questions
Exam open on Brightspace from 8:30 AM to 8:30 PM; 120 minutes on your personal clock

- Midterm 2, Thursday, March 11

Peter's topics 14% of course grade
30 multiple choice questions
Exam open on Brightspace from 8:30 AM to 8:30 PM; 90 minutes on your personal clock

- Final exam period; date to be determined

Dave's and Kim's topics 23% of course grade
50 multiple choice questions
Exam open on Brightspace from 8:30 AM to 8:30 PM; 150 minutes on your personal clock

Lab 45% of course grade
100%

You must pass the lab in order to pass the course . If you fail the lab (<22.5/45), your course grade will be F.

Biology 186 has nine lab sessions (not including exams). If you miss three or more of these, you will receive a course grade of F, even if you have a medical excuse for the missed sessions.

There will a final lab exam written with the final lecture exam in April.

In the lab, the Academic Integrity assignment is an official requirement of the course. That means that you must pass this assignment, or you will get an N (incomplete) in the course (see **Grading**, below).

It is not necessary to pass the lecture exams, either together or individually, to pass the course. It is possible to fail the lecture exams and still be saved by a good lab mark.

Deferred lecture exams

If you are ill the day of a lecture exam, please get ahold of the lecturer giving that exam to arrange a deferred writing.

Grading

At the University of Victoria, grades are submitted by instructors as percentages. These will be converted to letter grades by administration, according to the grading scale given in the university calendar.

We cannot change your grade, except if we have made an error in determining it. There is no extra work that you can do to raise your grade. *Please do not ask us to raise your grade because you need or want a higher one.*

No supplemental final exam (second-chance final exam) will be given in this course, although, as described above, you may defer the final exam if you are ill that day.

You will receive a grade of N (a failing grade which indicates that an essential course requirement was not completed) if you do not complete the academic integrity assignment in the lab.

You will receive an F in the course in any of these cases:

- you miss three or more labs, even with medical or other documentation
- you do not pass the lab
- you pass the lab but have an aggregate course grade less than 50%.

Cheating and Plagiarism

The University and the Biology Department deal with cheating and plagiarism as a serious matter, since ignoring it could be interpreted as endorsing dishonest practice in one's later professional career. To claim ignorance of the University's policy on academic integrity is, therefore, not excused.

Please read the policy carefully to avoid unpleasant misunderstandings. The policy can be found on the online UVic calendar:
http://web.uvic.ca/calendar2020-09/undergrad/info/regulations/academic-integrity.html

The University of Victoria Department of Biology reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.

Lab and Lecture Schedule

January 11 – 15

- No Lab

- Monday

Live Zoom introduction to the course (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

Lectures posted (Greg's topics) (posted January 8):
Biomolecules 1
Biomolecules 2
Biomolecules 3
Text reading (both the 2nd and 3rd editions):
Chapter 2 & 3 (I recommend that you read this if you don't know basic chemistry;
I won't be covering most of this material in class or in these lecture notes, but you have to know it to understand this course)
Chapter 4
Chapter 5

- Friday, lectures posted (Greg's topics):

Biomolecules 4
Biomolecules 5
Cell Tour 1

Text reading (both the 2nd and 3rd editions):
Chapter 6

January 18 – 22

- Lab 1

- Monday Zoom with Greg (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Greg's topics):

Cell Tour 2
Membranes and transport 1
Membranes and transport 2
Text reading (both the 2nd and 3rd editions):
Chapter 7

January 25 – 29

- Lab 2

- Monday Zoom with Greg (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Greg's topics):

Bioenergetics and metabolism
Respiration
Text reading:
Chapter 8 (2nd edition and 3rd edition)
Chapter 9, pp. 175-193 (2nd edition)
Chapter 9, pp. 176-194 (3rd edition)

February 1 – 5

- Lab 3

- Monday Zoom with Greg (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Peter's topics):

Plant structure; text reading Chapter 35, pp. 808-824 (2nd edition: pp. 802-819)
Water and mineral uptake; text reading Chapter 36, pp. 837-842 (2nd edition: pp. 831-836)
Transport systems; text reading Chapter 36, pp. 843-853 (2nd edition: pp. 837-847)

February 8 – 12

- Lab 4

- Monday Zoom with Greg (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Thursday

Midterm 1 (Greg's topics) – 40 multiple choice questions; test will be open 8:30 AM – 8:30 PM; you will have 120 minutes on your personal clock

- Friday, lectures posted (Peter's topics):

Photosynthesis – light reactions; text reading Chapter 10, pp. 199-213 (2nd edition: pp. 198-212)
Photosynthesis – dark reactions; text reading Chapter 10, pp. 213-217 (2nd edition: pp. 212-219)
Light and environmental signals; text reading Chapter 39, pp. 908-915 (2nd edition: pp. 901-907)

February 15 – 19

Reading Break – no lectures or labs

February 22 – 26

- Lab 5

- Monday Zoom with Peter (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Peter's topics):

Plant growth and phytohormones; text reading Chapter 39. pp. 895-908 (2nd ed: pp. 888-901)
Plants and environmental stress; text reading Chapter 39. pp. 915-919 (2nd edition: pp. 907-911)
Pest and pathogen defense; text reading Chapter 39. pp. 919-922 (2nd edition: pp. 912-914)

March 1 – 5

- Lab 6

- Monday Zoom with Peter (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Dave's topics):

Introduction to animal physiology; text reading Chapter 40, pp. 928-948 (2nd ed. pp. 920-940)
Thermoregulation and osmoregulation; text reading Chapter 44, pp. 1035-1040 (2nd ed. pp. 1025-1030)

March 8 – 12

- No lab

- Monday Zoom with Peter (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Thursday

Midterm 2 (Peter's topics) – 30 multiple choice questions; test will be open 8:30 AM – 8:30 PM; you will have 90 minutes on your personal clock

- Friday, lectures posted (Dave's topics):

Circulation and gas exchange; text readings Chapter 42, pp. 975-1005 (2nd ed. pp. 966-996)

March 15 – 19

- Lab 7

- Monday Zoom with Dave (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Dave's topics):

Immune system; text readings Chapter 43, pp. 1008-1032 (2nd ed. pp. 999-1022)

March 22 – 26

- Lab 8

- Monday Zoom with Dave (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Friday, lectures posted (Dave's topics):

Neurons and nervous systems; text readings Chapter 48, pp. 1129-1145 (2nd ed. pp. 1120-1135), Chapter 49, pp. 1147-1152 (2nd ed. 1138-1143)

March 29 – April 2

- Lab 9

- Monday Zoom with Dave (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

- Thursday, lectures posted (Dave's and Kim's topics):

Sensory and motor mechanisms; text readings Chapter 50, pp. 1170-1179 (2nd 1162-1170), pp. 1189-1199 (2nd ed. pp. 1180-1189)
DNA replication and gene expression; text readings Chapter 16, Chapter 17 (specific pages TBA)

- Friday – Good Friday

April 5 – 9

- Monday – Easter Monday

- No lab

April 12 (Monday)

- Monday Zoom with Dave (scheduled lecture section times: 10:00 AM, 1:00 PM, 3:30 PM)

End of term

April 15 – 27

Exam period; includes both Sundays

The Biology 186 final exam will occur on a date the university will announce in February. It will have two parts:

- The lecture part will cover only Dave's and Kim's topics, and will have 50 multiple choice questions. The exam will be open from 8:30 AM – 8:30 PM; you will have 150 minutes on your personal clock.
- The lab part – details to be announced later.