



COURSE OUTLINE

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

- Ω 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

(a)	Instructor:	Dr. Larry Anthony
(b)	Drop-In Office Hours:	Mon / Wed 11:50–12:20; 3:20–5:20
(c)	Location:	F314A
(d)	Phone:	250-370-3459
(e)	Email:	anthonyl@camosun.bc.ca
(f)	Website:	http://online.camosun.ca/ (D2L)

IMPORTANT NOTE: I understand that my scheduled drop-in office hour times will not fit into everyone's class schedules. ***This should not deter you from trying to visit me in my office!*** My schedule will be posted on my office door and on the course D2L website: I can be available at almost any time that I'm not already in class or lab. Simply arrange an appointment by phone or e-mail and I'll be very pleased to meet with you at a mutually convenient time.

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

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

1. Demonstrate detailed knowledge of prokaryotic cell structure, function and physiology. Compare and contrast, at the molecular level, the distinguishing characteristics of the Gram-positive and Gram-negative Bacteria and the Archaea.
2. Explain the nature of prokaryotic cellular and population growth, and describe the ways growth can be measured. Explain the mechanisms of nutrient acquisition and categorize the nutritional patterns of microorganisms. Discuss the influence of environmental factors on microbial growth.
3. Compare the effectiveness and identify the appropriate use of physical and chemical agents to achieve decontamination, disinfection and sterilization. Explain the molecular mechanism and spectrum of activity of selected antibacterial and antiviral drugs. Discuss the mechanisms of drug resistance. Outline the induction and mechanisms of programmed cell death.
4. Discuss the diversity of metabolic strategies employed by bacteria for energy conversion. Compare and contrast heterotrophic ATP generation through the processes of aerobic respiration, anaerobic respiration and fermentation. Explain the events associated with lithotrophic ATP generation.
5. Describe the characteristics and molecular structure of enveloped and non-enveloped viruses. Describe the replication cycle and quantification of viruses. Compare and contrast, at the molecular level, the replication strategies of DNA and RNA containing animal viruses. Differentiate between the types of virus infectious cycle.
6. Conduct experiments to demonstrate techniques in microbial staining, culturing, biochemical characterization and enumeration. Collect and assess data; present written laboratory reports.

3. Required Materials

Text: Willey, Sherwood & Woolverton (2017) *Prescott's Microbiology* 10th Edition, (McGraw-Hill)

Lab Manual: Biology 202 lab outlines will be posted on the Biology 202 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.

Lab Coat: Lab coats are required for laboratory work. For safety reasons they will be stored in a dedicated closet in the microbiology laboratory and will not be available for use in other courses.

Lecture Outlines: Lectures will be delivered in a PowerPoint format. PowerPoint slides will be made available on the Biology 202 D2L website. These may be used or printed at the student's discretion to help follow the lectures.

4. Course Content and Schedule

(This section can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

Class Schedule:

Lectures:	Mon	10:30 – 11:50	F202
	Wed	10:30 – 11:50	F202
Lab Section B:	Fri	9:30 – 12:30	F222
Lab Section A:	Fri	1:30 – 4:30	F222

Course Content:

See Last Page

5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

Lecture Midterm 1	15%
Lecture Midterm 2	20%
Lab Exam 1	12.5%
Lab Exam 2	12.5%
Lecture Final Exam	25%
Assignments / Labs / Quizzes	15%

Please note: It is understood that life circumstances may negatively affect an individual's performance on an individual exam. Because the final exam is cumulative, if **ONE** midterm lecture exam mark is **less than 60%**, there is an opportunity to re-weight the value of that midterm, transferring some (**but not all**) of its value to the final exam. For this to occur certain strict criteria need to be met:

1. The student must request this adjustment **in writing (by e-mail)**; the instructor **will not** make it automatically. The request must specify which of the two midterms (**not both**) to be re-weighted.
2. The student must be willing to do supplementary questions added to the final exam in order to ensure the topic areas were adequately covered.
3. A minimum of 65% must be obtained on the additional questions or no re-weighting will occur.
4. A minimum of 65% must be obtained **OVERALL** on the final exam or no re-weighting will occur. This is to show that the reason for the poor midterm mark has been overcome.

If the above criteria are met the following strategy will be executed to obtain a final grade:

1. The weight of the unsatisfactory midterm lecture exam mark will be **reduced** by two-thirds (e.g. from 15% to 5% in the case of Midterm 1).
2. The weight of the final exam will be **increased** by the amount reduced on the midterm (e.g. from 25% to 35% if Midterm 1 were re-weighted).

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)

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 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 3rd 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.

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 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 (see <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.1.pdf>). Plagiarism is a serious offence and is considered to be academic misconduct, and so **will not be tolerated**. Except where work is assigned to a group, all written work, **including lab data processing** and graphs, must be done individually.

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:

- (a) using unauthorized materials or resources in a quiz/exam, and
- (b) 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-and-support/e-2.5.pdf>) and penalties may be severe.

Student Safety

NOTHING is more important to the instructor than students enjoying a safe class and lab environment. In addition, we will use in our labs organisms capable of causing infection. While the likelihood of laboratory acquired infection is very low and the organisms are easily eliminated with antibiotic therapy, Camosun is nevertheless mandated by federal and provincial legislation and regulations to conform to strict safety standards. These will be outlined fully in the lab, but consider the following issues:

Lab footwear	<ul style="list-style-type: none"> For safety reasons WorkSafeBC mandates, and federal regulations require, that students are required to wear closed shoes in all lab times. Flip flops, sandals or shoes with holes are not acceptable.
Lab coats	<ul style="list-style-type: none"> For regulatory, safety and professional reasons, it is mandatory to wear a lab coat during all lab sessions. Cloth coats are preferable and are more comfortable but disposable ones are acceptable. Failure to wear proper lab attire will result in the inability to enter the lab and the subsequent loss of credit for that lab, including any lab assessment credit. While in the lab the lab coat must be completely buttoned. The lab coat must NEVER be worn outside of the lab. If you must leave the lab for any reason you must remove your lab coat.
Eating & drinking	<ul style="list-style-type: none"> Eating or drinking anything in the lab is a violation of federal regulations, so absolutely NOTHING may be ingested while in the lab. Chewing gum and applying makeup or lip balm are similarly prohibited. NO EXCEPTIONS will be made, even for medications. If something must be consumed, then it may be taken out of the lab.
Hair	<ul style="list-style-type: none"> It is recommended that long hair be tied securely to prevent it from being exposed to lab equipment.
Handwashing	<ul style="list-style-type: none"> Hands should be thoroughly washed AFTER removing lab coats and BEFORE leaving the lab. Proper procedure will be demonstrated and practised.

Laboratory Attendance

Lab work is critical to the course objectives and much effort has been expended to ensure the lab experience is interesting and educational, both from academic and practical points of view. Therefore, attendance throughout the entire laboratory session is mandatory and will be noted. Labs will start promptly (after a five-minute grace period) because 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. Lateness in arriving, failure to attend the lab 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 Lecture Exams

Without exception, all lecture exams must be written at the scheduled times. 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 the student: (a) notifies the instructor **in advance** of the exam (not after), and (b) provides documented evidence of the circumstance (i.e. medical certificate).

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

Be sure not to make travel plans for the end of semester until the final exam schedules are finalized and posted. Please ask any family members who might make travel plans on your behalf to consult you before booking tickets.

Without exception, the accommodation will be in the form of adjusting the weighting of the final exam to make up the missing marks. **Under no circumstances will a make-up lecture exam be administered.** In such cases, the final exam will include extra questions to thoroughly examine knowledge of previously untested subject matter.

Missed Lab Exams

Lab exams differ from lecture exams in their formatting and the fact that they cover lab content in a non-cumulative manner. Administering a makeup lab exam will be at the discretion of the instructor.

Written Work

Lecture and lab assignments may 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, keeping in mind student conduct requirements. 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.

Unless otherwise indicated, all written material to hand in (including numerical entries in data tables) must be prepared using word processing (typically MS Word) or graphing software (e.g. Excel). The only exceptions are calculations and **some** graphs, which may be submitted handwritten or hand drawn. **Any exceptions will be clearly indicated.** Work submitted inappropriately formatted, which includes last-minute handwritten corrections, will not be marked until all formatting is correct. Since correcting formatting requires time, this will likely mean a late penalty will be assessed.

MS Word templates will be provided for assignment purposes by posting on the course D2L website; these templates should not be altered except to complete the blank areas. All written work must be submitted in **hard copy**, not e-mailed or posted to the D2L website. Exceptions to this policy are rare and made only at the discretion of the instructor. 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 easily go missing. **Always be on the lookout for special instructions.**

Late Penalties

All assignments must be handed in by the **time indicated on the assignment**. If the instructor is not in the office, then slide your work under the office door. Late assignments 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 only count as one day).

Summary of Student Responsibilities

1. 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).
2. Students must hand in required assignments on time or be subject to penalty.
3. Electronic submissions of assignments (e.g. as e-mail attachments) will **NOT** be accepted.
4. Evaluation of written or oral work will not be given if a student is not present.
5. Students must work independently, except when a group effort is required.
6. Students must know and follow all Safety Rules and Procedures. Students must sign the Safety Contract before participating in any laboratory activity.
7. All safety measures must be followed, with **NO EXCEPTIONS**.
8. The use of cell phones is prohibited in the lab.
9. All laboratories start punctually.

Biology 202 – F16 – Course Schedule (Note: Scheduled dates and specific topics are subject to change)

Topics may be added or deleted depending upon time constraints

Wk	Day	Date	Unit	Lecture Topic	Chap	Lab	Lab Activity
1	Mon	5-Sep		LABOUR DAY - NO CLASSES			
1	Wed	7-Sep		Course Introduction			
1	Fri	9-Sep				1	Biological Safety & Handwashing
2	Mon	12-Sep	1	Introduction to Microbiology	1		
2	Wed	14-Sep	2	Bacterial Cell Structure & Function	3		
2	Fri	16-Sep				2	Aseptic Technique & Microscopy
3	Mon	19-Sep	2	Bacterial Cell Structure & Function	3		
3	Wed	21-Sep	2	Bacterial Cell Structure & Function	3		
3	Fri	23-Sep				3	Cell Staining Techniques
4	Mon	26-Sep	2	Bacterial Cell Structure & Function	3		
4	Wed	28-Sep	2	Bacterial Cell Structure & Function	3		
4	Fri	30-Sep				4/5	Bacterial Culture Media
5	Mon	3-Oct		LECTURE MIDTERM 1			
5	Wed	5-Oct	2	Archaeal Cell Structure & Function	4		
5	Fri	7-Oct				6	Bacterial Enumeration
6	Mon	10-Oct		THANKSGIVING - NO CLASSES			
6	Wed	12-Oct	3	Bacterial Growth and Reproduction	7		
6	Fri	14-Oct				7	Environmental Growth Influences
7	Mon	17-Oct	3	Bacterial Growth and Reproduction	7		
7	Wed	19-Oct	3	Bacterial Growth and Reproduction	7		
7	Fri	21-Oct					LAB EXAM 1
8	Mon	24-Oct	4	Control of Microbial Growth	8/9		
8	Wed	26-Oct	4	Control of Microbial Growth	8/9		
8	Fri	28-Oct				8	Biochemical Analysis
9	Mon	31-Oct	4	Control of Microbial Growth	8/9		
9	Wed	2-Nov	5	Virology	6		
9	Fri	4-Nov				9	Microbial Growth Control
10	Mon	7-Nov		LECTURE MIDTERM 2			
10	Wed	9-Nov	5	Virology	6		
10	Fri	11-Nov		REMEMBRANCE DAY - NO CLASSES			NO LAB
11	Mon	14-Nov	5	Virology	6		
11	Wed	16-Nov	5	Virology	6		
11	Fri	18-Nov				10	Turbidometry & Cell Density
12	Mon	21-Nov	6	Microbial Metabolism	10/11		
12	Wed	23-Nov	6	Microbial Metabolism	10/11		
12	Fri	25-Nov				11/12	Generation Time & Pour Plating
13	Mon	28-Nov	6	Microbial Metabolism	10/11		
13	Wed	30-Nov	6	Microbial Metabolism	10/11		
13	Fri	2-Dec				13	Bacteriophages
14	Mon	5-Dec	6	Microbial Metabolism	10/11		
14	Wed	7-Dec	6	Microbial Metabolism	10/11		
14	Fri	9-Dec					LAB EXAM 2
	Mon	12-Dec		FINAL EXAM PERIOD BEGINS			