MICR*2430 Methods in Microbial Culture and Physiology

Winter 2021
Section(s): C01

Department of Molecular and Cellular Biology
Credit Weight: 0.50
Version 1.00 - January 08, 2021

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1 Course Details

1.1 Calendar Description

This course uses a hands-on approach to investigate microbial growth and factors that impact growth and the interactions of microbes with biotic and abiotic environments. This course will explore the ecological diversity of microorganisms of selected environments. Students will develop a wide range of microbiology-related laboratory skills.

Pre-Requisites:	MICR*2420
Restrictions:	This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations or semester levels during certain periods. Please see the departmental website for more information.

1.2 Course Description

This course will be taught using a 100% online format for the Winter 2021 semester. Students will engage with their classmates and instructors by video conferencing while learning course material with the help of the provided prerecorded video demonstrations custom made for this course.

1.3 Timetable

1. Lecture Time Slot: Tues. 11:30 - 12:50 pm Eastern Time. Lectures to be delivered asynchronously and uploaded to CourseLink Content. The scheduled lecture time will be used for questions re. the course material/assigned readings, group work on problems, and topic quizzes.
2. Labs: Wed, Thurs., Fri. 2:30 - 5:20 pm Eastern Time, Online via Zoom

- Labs begin Wed. Jan. 13th

1.4 Final Exam

April 24, 11:30-1:30

Online - CourseLink using LockDown Browser

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2 Instructional Support

2.1 Instructional Support Team

Instructor:	Wendy Keenleyside
Email:	wkeenley@uoguelph.ca
Office:	Virtual
Office Hours:	As per the University's COVID-19 protocol, no face-to-face meetings will be held in Winter 2021. Lectures will be asynchronous and accompanied with assigned textbook readings and posted reading guides. More immediate content-related questions should be addressed using the discussion board, which will be checked regularly. Class time (Tuesdays from 11:30 - 12:50 pm Eastern Time) will be used for group discussion & problem-solving and post-quiz review
Lab Co-ordinator:	Rohan van Twest
Email:	rvantwes@uoguelph.ca
Office:	Virtual
Office Hours:	As per Covid protocol, there will be no face to face meetings. Rohan can be reached via email or virtual meetings. The discussion board will be closely monitored.

2.2 Teaching Assistants

Teaching Assistant:	Dmytro Brozdnychenko
Email:	dbrozdny@uoguelph.ca
Teaching Assistant:	Riley Elder
Email:	elderr@uoguelph.ca

Teaching Assistant: Greg Higgins
Email: higginsg@uoguelph.ca

Teaching Assistant: Allison Leonard
Email: aleona03@uoguelph.ca

Teaching Assistant: Avery Robinson
Email: arobin17@uoguelph.ca

Teaching Assistant: Safia Mahabub Sauty
Email: ssauty@uoguelph.ca

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3 Learning Resources

3.1 Required Resources

Microbiology: Canadian Edition (Textbook)
https://openlibrary.ecampusontario.ca/catalogue/item/?id=0a20e9e2-f721-4c67-b555-097c56f336b2

- **By Keenleyside *et al*. Adapted from Microbiology by Openstax, specifically for MICR2420, MICR2430 & MICR3420.**
- **This is an Open Education Resource (OER): the e-book is free, is searchable, contains hot-links and end-of-chapter interactive review questions. For those who prefer hard-copies, these can be printed at cost, through an associated "Order a Print Copy" function when accessing the e-book.**

Laboratory Manual (Lab Manual)
Required lab materials will be provided as a downloadable file on CourseLink under the course content.

Courselink (Website)
https://courselink.uoguelph.ca
The course website will be used extensively and will include all relevant course materials, including lecture videos, online lab materials, online quizzes, discussion boards, links for additional readings, group drop boxes and a course calendar will provide all relevant information on due dates.

CourseLink Calendar (Other)
Details with respect to due dates of assignments and quizzes will be added to the Course Calendar within CourseLink.

Zoom (Website)
https://zoom.us/meetings

"Labs" and weekly classes will be hosted via Zoom. Students do not need to purchase a Zoom Pro account but do need to register for a free account using their University of Guelph email address and full name as appears on their student card.

PEAR Tool (Website)

https://www.uoguelph.ca/peartool/user/signon.cfm?destination=index%2Ecfm

UofG online platform for **P**eer **E**valuation **A**ssessment and **R**eview. This will be used for the peer evaluation component of the Case Study Ch. 2 concept questions, and for the final anonymous evaluation of the distribution of effort among team members.

Brightspace Test Question Generator (Website)

https://plato.algonquincollege.com/BrightspaceQuizGenerator/

This is a free online tool developed by Algonquin College to provide an easy way of creating a collection of properly formatted questions that can be imported into Courselink quizzes and question pools. Such questions may be submitted to dropbox, on a weekly basis, to earn Curriculum engagement marks and Dr. K. will regularly import correct questions from dropbox to a non-graded syllabus topic practice quiz. Any high quality questions will also be incorporated into a Syllabus topic quiz and/or the final exam.

CourseLink Discussion Board (Website)

The discussion board on CourseLink will be closely monitored by all members of the teaching staff.

Questions about course content should first be asked here to offer other students the chance to respond and also to make the corresponding answer available to all students (who likely will be wondering the same thing)

3.2 Recommended Resources

Team Outlook Calendars (Website)

Once case study teams have been created, members are encouraged to establish a shared team calendar to ensure all established and internally-agreed upon deadlines and meeting dates are readily accessible.

3.3 Additional Resources

Microsoft Teams (Website)

Microsoft Teams will be used to host lab meetings **ONLY IF** technical problems occur with the Zoom platform. Should this situation arise students will be instructed on how to proceed via a CourseLink announcement.

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4 Learning Outcomes

Course Goals

This course is designed as an active learning course, where students learn the concepts of microbial growth, metabolism, cultivation and ecology, through independent reading, group discussions and online lab exercises which include, in the second half of the semester, a case study and case study teams. Note that the case study will simultaneously cover a majority of the course learning outcomes as well as the broader MCB program Learning Outcomes (including Problem solving & Critical thinking, Communication, Professional & Ethical behaviour) and the University of Guelph learning outcomes (including Critical & Creative Thinking, Literacy, Communicating & Professional & Ethical Behaviour).

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Demonstrate an understanding that chemical transformations of biological molecules are catalyzed by enzymes organized in metabolic pathways, and that these pathways are regulated
2. Understand and appreciate the metabolic diversity among eukaryotes, prokaryotes and archaea
3. Be able to describe how thermodynamically unfavourable processes occur
4. Understand that the properties of cells are a function of the chemical structures of their constituent macromolecules and be able to describe some of the macromolecular interactions essential to cell function
5. Appreciate the roles of cells as the fundamental unit of life and the role of the prokaryotes in the evolution of eukaryotic cells, their organelles, and the major metabolic pathways
6. Demonstrate an understanding of communication within and between cells and their environment
7. Demonstrate an understanding of the molecular structure, function and regulation of genes and genomes and be able to explain, with examples, how environmental factors may affect the frequency of genotypes and phenotypes in a population
8. Understand and appreciate the role of antimicrobials on earth, not only in the field of medicine but also their original origin as important microbial adaptation and defensive strategies
9. Successfully design and explain experiments for the isolation, identification and enumeration of microbes or assess such proposals
10. Accurately describe experiments, including the use of appropriate safety precautions, and microbiological techniques for the isolation, identification and enumeration of representative groups of bacteria and fungi
11. Use appropriate and accurate mathematical calculations and statistical analyses and

assess the reliability of data using biological and technical replicates

12. Successfully interpret and communicate scientific data in laboratory reports, group assignments and tests
13. Through open and regular communication between team members, learn to become an effective research team, understand the essential difference between a group and a team, and further develop team skills
14. Demonstrate a good work ethic by setting goals, meeting deadlines and working cooperatively and responsibly with team members

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5 Teaching and Learning Activities

Lectures will be asynchronous: video(s) for weeks 1-10, along with an associated reading guides, will be uploaded prior to the beginning of the week.

Tuesday class times (11:30-12:50) will be hosted online *via* Zoom and will be used specifically for group and class discussions and problem-solving of questions (generally higher-level) on that week's concepts and/or review of problem areas identified by the most recent **syllabus topic quiz.** While these are expected to be extremely helpful, attendance is optional, as is participation. These classes will be recorded, and any slides will be posted.

5.1 Lecture

Week 1

Topics:

Lecture video:

Syllabus Topic 1 - **Growth in the environment & lab**

Zoom class: January 12

1. Introduction to course & active learning online format.
2. Review of basic concepts

References:

Studying 101:
https://theeffortfuleducator.com/2020/10/22/studying-101

Microbiology: Canadian Edition

- Review of basic concepts Sec. 1.2-1.3, 7.1-7.4, 11.2
- Syllabus topic 1: Sec. 4.1, 9.3 & lab manual

Week 2

Topics:

Lecture video:

Syllabus topic 1 - continued

Zoom class: January 19

Topic 1 discussion & problems

References: **Microbiology: Canadian Edition** Sec. 9.3 & lab manual

Week 3

Topics:

Lecture video:

Syllabus topic 2 - **Growth Kinetics & Enumeration**

Zoom class: January 26

Syllabus Topic 1 post-quiz review

References: **Microbiology: Canadian Edition** Sec. 9.2 & lab manual

Week 4

Topics:

Lecture video:

Syllabus topic 3 - **The Cell Membrane & Transport**

Zoom class: Feb. 2

Topic 2 discussion & problems

References: **Microbiology: Canadian Edition** Sec. 3.3 & lab manual

Week 5

Topics: **Lecture video:**

Syllabus topic 3 - continued

Syllabus topic 4 - **Environmental influences on microbial growth.**

Zoom class: Feb. 9

Syllabus Topic 2 post-quiz review

Topic 3 discussion & problems

References: **Microbiology: Canadian Edition** Sec. 3.3, 9.4, 9.6 (review 7.3 & 7.4)

Tue, Feb 16

Topics: Winter break week - no classes or lectures

Week 6

Topics: **Lecture video:**

Syllabus topic 4 - continued

Zoom class: Feb. 23

Syllabus Topic 3 post-quiz review

References: **Microbiology: Canadian Edition** 9.4, 9.7 & lab manual

Week 7

Topics: **Lecture video:**

Syllabus topic 5 - **The Biochemistry of Catabolism**

Zoom class: March 2

Topic 4 discussion & problems

References: **Microbiology: Canadian Edition** Ch. 8 Intro, Sec. 8.1, 8.2, 8.4, lab manual/case study

Week 8

Topics: **Lecture video:**

Syllabus topic 5 - continued

Zoom class: March 9

Syllabus topic 4 post-quiz review

References: **Microbiology: Canadian Edition** Sec. 8.3, 8.5, 10.3, lab manual/case study

Week 9

Topics: **Lecture video:**

Syllabus topic 6 - **Microbial Diversity & Ecology**

Zoom class: March 16

Syllabus Topic 5 discussion & problems

References: Sec. 8.6 & Case study

Week 10

Topics: **Lecture video:**

Syllabus topic 6 - continued

Zoom class: March 23

Syllabus Topic 5 post-quiz review

References: Sec. 8.7, 9.1, 10.1, 10.6 & Case study

Week 11

Topics: **Lecture video:**

None

Zoom class: March 30

Syllabus Topic 6 discussion & problems

Week 12

Topics: **Lecture video:**

None

Zoom class: April 6

Review

5.2 Course Content: Labs

Week	Lab Topic	Readings
Jan. 13-15	Exp. 1 - Soil microbiology	Laboratory 1
Jan. 20-22	Exp. 2 - Bacterial physiological diversity	Laboratory 2
Jan. 27-29	Exp. 3 - Water quality testing	Laboratory 3
Feb. 3-5	Exp. 4 - Comparative counting & growth	Laboratory 4
Feb. 10-12	Exp. 5 – Biochemical tests part 1 Introduction to Case Study & team members	Laboratory 5 & Introduction to Case Study
Feb. 24-26	Exp. 6 – Biochemical tests part 2 Case Study Ch 1	Laboratory 6 Case Study Ch.

Week	**Lab Topic**	**Readings**
	Team Charter due	1 & Ch. 1 readings*
Mar. 3-5	Exp. 7 – Antibiotic Testing Ch 1 concept question answers due; team discussions Ch. 1 team quiz	Laboratory 7 & Case Study Ch. 1 & Ch. 1 readings
Mar. 10-12	Case study Ch. 2	Case Study Ch. 2 & Ch. 2 readings
Mar. 17-19	Ch. 2 PEARTool submissions due; team discussions Ch. 2 team quiz	Case Study Ch. 2 & Ch. 2 readings
Mar. 24-26	Ch. 2 PEARTool reviews due Ch. 3	Case Study Ch. 3 & Ch. 3 readings
Mar. 31- Apr. 5**	No lab Ch. 2 concept question answers due**	Case Study Ch. 3 & Ch. 3 readings

Week	Lab Topic	Readings
Apr. 7-9	Ch. 3 concept question answers due; team discussions Ch. 3 team quiz	Case Study Ch. 3 & Ch. 3 readings

- Case study readings are given in the case study, published in the course manual and uploaded to Courselink. Other readings are provided via link or pdf on Courselink
- **Apr. 2 is Good Friday. Friday's lab sections submit their answers ***Monday by 2:30***

5.3 Method of Presentation

Students will learn the techniques and concepts through online classes & lab sessions, combined with independent reading, video (asynchronous) lectures, laboratory demonstrations, quizzes, group/team discussions and team work in an interactive case study and collaborative tests/test questions. Online class and lab sessions will be highly interactive and designed to promote a deeper knowledge of course concepts. **Simple concepts and definitions will be itemized and covered through independent reading, laboratory exercise introductions and associated reading guides; these will not be covered during class but WILL be assessed.**

5.4 Teamwork

This is a major component of the course due to the documented advantages of peer discussion and instruction (cognitive psychologists call this "argumentation"), to facilitate deeper learning. This is also a critical skill in the workplace, and in scientific communication. Case Study teams of 6-7 will be formed week 5 and will work together in break-out rooms during online lab sessions and class time, as well as outside of class/lab time. Teams will be constructed following best practices, using student answers to a survey. Team member accountability will be ensured through an initial “Team Charter”, a "Team Effectiveness Feedback Summary" and finally, through anonymous peer evaluations of the distribution of effort, using the UofG PEARTool. The average scores from those anonymous assessments will be used to assign individual case study grades from the team grade, within a specified range.

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6 Assessments

In recognition of the challenges on online classes, the number of assessments for this course has been reduced compared to previous semesters. The pre-lab quizzes, lecture reading quizzes and midterm of previous offerings, have all been eliminated. There are instead, 5 **non-cumulative** syllabus topic quizzes.

It is hoped that student work-loads and stress levels will be reduced as a result of these changes. However, these changes will also mean that it is entirely the student's responsibility to keep up with the textbook and lab readings. The final exam **IS** cumulative, so students will also be expected to keep reviewing previously covered material. In order to help facilitate this, ungraded practice quizzes for each of the 6 topics will be available and updated throughout the semester. In addition, the topics are organized so that there is a logical progression and subsequent topics build on the concepts from previous ones. The case study integrates all of the course topics.

6.1 Marking Schemes & Distributions

Total quiz grade weight transferred to final exam if final exam grade is higher. There will be no alternative quizzes for students who are unable to write during the scheduled time (see above for quiz consideration).

Name	Scheme A (%)	Scheme B (%)
Syllabus topic quizzes (best 4 of 5)	20	0
Laboratory reports	20	20
Case study	15	15
Bonus activities	0	0
Final exam (A + B)	40	60
Curriculum Engagement	5	5
Total	100	100

6.2 Assessment Details

Syllabus topic quizzes (20%)

Date: Available for a 24h window, beginning 9:00AM (EST) on the Monday following completion of topics 1-5 (not #6), Online via Courselink with LockDown Browser

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 9, 10, 11

Short non-cumulative quizzes, consisting of largely higher-level multiple-choice questions, these will include any directly related material **from labs completed to-date.**

These will be of a length calculated to require no more than 30 min. for completion, assuming the student has studied. *All students will have 2h to complete each quiz, and a 24h window in which to write it, beginning at 9:00AM (EST) on the Monday***.**

1. Jan. 25-26, 2021 - **Growth in the Environment and Lab**
2. Feb. 8-9, 2021 - **Growth Kinetics and Enumeration**
3. Feb. 22-23, 2021 - **The Cell Membrane and Transport**
4. Mar. 8-9, 2021 - **The Influence of the Environment on Microbial Growth**
5. Mar. 22-23, 2021 - **The Biochemistry of Catabolism**

- Individual quizzes will not be handed back but any areas of confusion will be discussed during the Tuesday Zoom class that immediately follows a quiz. Individual appointments to further discuss conceptual difficulties can be made with Dr. Keenleyside
- Textbook content that is **tested but not covered in class** is the more basic material (e.g. definitions) identified in the posted reading guides and usually also covered in the introductions to lab exercises 1-7.
- There is no Syllabus Topic quiz for the 6th topic, **Microbial Diversity & Ecology**. This topic is itself cumulative with respect to the previously-covered course topics, and will be assessed through the Case Study team quizzes.

Best 4 of 5 grades; each quiz is worth 5%. **No make-up quizzes.** If a student misses more than 1 quiz, the grade weight may be transferred to the final exam, **OR** the student may be required to do a separate assignment (the nature of which will be determined by Dr. Keenleyside), on that topic.

For any student whose cumulative final assignment + final exam grade exceeds the total quiz grade, marking scheme B will be used.

Laboratory reports (20%)

Date: Laboratory exercises 1-7
Learning Outcome: 1, 2, 4, 7, 8, 9, 10, 11, 12, 14
Reports are due at 12:00 p.m. (noon) Eastern Time, the Monday following the respective lab period, online to dropbox within CourseLink. Late reports will lose 10% per day up to a maximum of 3 days, after which reports will no longer be accepted. Any submission issues should be discussed with Rohan (rvantwes@uoguelph.ca)

Case study (15%)

Date: Wed, Mar 3 - Fri, Apr 9, In online lab and outside of lab time
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

- Course Content: "*Delicate Balance, Deadly Obsession*"
- Various small dropbox due dates associated with preliminary work for each of 3 chapters.

- Chapter quizzes are written individually during lab time, while in breakout rooms (no LockDown Browser). They are preceded by team discussions with TA, lab & course instructor guidance:

    1. Chapter 1 - **Mar. 3-5**
    2. Chapter 2 - **Mar. 17-19**
    3. Chapter 3 - **Apr. 7-9**

- Individual grades assigned based on the (team grade) x average score (as %) from the team's distribution of effort assessments

Curriculum engagement (5%)

Date: Every 3 weeks, Zoom classes & online
This grade is assessed every third Friday, based on a student's engagement during the previous 3 weeks. This will begin Friday Jan. 29. The grade may be calculated from **either** of the following two weekly activities:

Zoom classes

- In addition to the quiz reviews, the scheduled lecture slot will be used for active learning of concepts, using a combination of break-out rooms for group work on problems, polling and class discussions (essentially a group office hour). Students will be polled multiple times per class to provide formative feedback on comprehension. **Students receive full marks (3/3) for answering at least 50% of the polled questions in each of the previous 3 classes, 2/3 for 2 classes, and 1/3 for one of the classes**.

Brightspace Test Question Generator

- Questions may be submitted to dropbox, **in the correct format** (instructions for formatting on website), on course material covered to that point. Dr. K. will regularly import a selection of these to a **practice quiz** pool for each syllabus topic and students will also earn engagement marks by answering these quizzes. The first class will include a brief discussion of Bloom's taxonomy and specifically what makes good, higher level MCQs. Any good quality, higher Bloom's level questions will be considered for inclusion in the the **Syllabus**

Topic quizzes and the **final exam**; selection of any of your questions will also earn you engagement marks. So you will derive triple benefits from authoring, and answering questions: you will be learning and reviewing, as you do both, you will be earning marks, and you will be increasing the likelihood that you have already seen some questions AND THEIR ANSWERS on an assessment!
To receive full marks (3/3): students must submit **2 questions (with answers)** on material covered during the 3 week period **(2/3)**, **and** complete one of the practice quizzes **(1/3)**.

Final exam part A: take-home component (10%)
Date: Thu, Apr 22
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Assignment will be provided at least 1 week prior to the due date, and may be completed individually or in groups up to 7 students.

Multiple choice and long answer, case study format.

Due to CourseLink Dropbox by **11:59 pm EST, April 22.**

Final examination (part B) (30%)
Date: Sat, Apr 24, 11:30 AM - 1:30 PM, Online via CourseLink using LockDown Browser
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

- Course Content: Cumulative including lecture content, textbook readings, lab and case study material
- MCQs & short answer
- Textbook content that is tested but not covered in class is the more basic material (e.g. definitions) identified in the posted reading guides and usually also covered in the introductions to lab exercises 1-7 and the case study questions.

Bonus activities (0%)
Up to a maximum of 2.0% bonus will be added to the 5% curriculum engagement grade, which will be allowed to exceed 100%.

- 2% earned when a student earns full marks for **BOTH** engagement activities in 2 of the 4 assessment periods**.**
- 1% earned when a student earns full marks for **BOTH** engagement activities in 1 of the 4 assessment periods**.**

- 1% if any of a student's PEERWise questions are included in a Syllabus Topic quiz, or the final exam.

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7 Course Statements

7.1 Grading

1. Syllabus topic quizzes - students who MISS more than one will either have the grade weight transferred to the final exam, or may be asked to do an assignment (worth 5%) on the topic. The nature of this assignment will be determined by Dr. Keenleyside. For any student who performs better on the combined final exam (examination + take-home final assignment), the total quiz grade will be dropped and the grade weight transferred to the final exam.
2. Bonus activities - students may earn bonus marks towards their Curriculum Engagement grade (which will be allowed to exceed 5/5) via Zoom and/or authoring review question quizzes and taking a review quiz, and for authoring 1 or more quiz questions that are selected for inclusion in a syllabus topic quiz, or final exam.
3. Assignments/reports – lab reports are due by 12:00 pm (noon) Eastern Time on the Monday following the respective lab period; the details for case study submission are described in the **"Introduction to the case study"**, on Courselink. For lab reports, deductions for late submissions will be 10% per day, up to a 30% deduction. After 3 days, the submission will not be accepted. For the case study submissions, marks may be deducted, and any deductions will be applied to the **Team grade.** Problems lab report submission should be discussed with Rohan (**rvantwes@uoguelph.ca**) and for the case study, with Dr. K. (**wkeenley@uoguelph.ca**).

7.2 Emails

1. Student e-mails from non-UofG accounts will not be answered.
2. Questions about any of the online quiz questions will not be answered until after the quiz closes.
3. Use email for personal issues. Students should not expect to receive replies

outside of regular weekday hours (9 am-5 pm Eastern Time). Please allow up to 2 business days for a reply.

4. All questions related to Course/Lab **content** should be posted to the Discussion board on Courselink. This discussion board will be actively monitored by GTAs and instructors and students are encouraged to answer their classmate's queries. If you e-mail the instructors or TAs asking for information that is available in the Courselink calendar, Courselink announcements, the Course outline (admittedly very long), the "Introduction to the Case Study" file, or the posted lab introduction (i.e. questions about where, when, why or how), you will be directed to the posted source and subsequent similar types of queries will not be answered. When in doubt, post your question to the discussion board!
5. E-mails must include your full name. Please use the same tone/style of email you would use when e-mailing a future employer or possible referee. Consider it practice!

7.3 Student Responsibilities

1. **Respectfulness:** students are expected to treat teammates, classmates, the instructor and teaching staff with respect at all times. In Zoom classes, this means not talking while the instructor or another student is talking, "putting up your hand" in order to ask a question and using the chat function responsibly.
2. **Lab attendance is mandatory**. If you cannot attend an online laboratory session due to medical, psychological or compassionate reasons, or to being in a completely different time zone, please e-mail the **lab coordinator** to discuss your situation and options. Attendance will be taken at the end of each online lab period. Students not present at that time will be required to write a short summary of the material missed for that lab period. Details of this make up assignment will be given on a case by case basis. Failure to complete this by the given due date will result in a 10% deduction on the respective lab report. This 10% will be in addition to any further deductions should the report be handed in after the given due date. STUDENTS WILL ONLY BE PERMITTED TO ATTEND THEIR LAB SECTION, as shown on web advisor.
3. **Laboratory preparedness:** You must read the relevant laboratory exercise in advance of the lab and watch the online lab demonstration videos, prior to attending the lab section. Reading guides for weeks 1-7 include names, terms and definitions from relevant lab introductions covered at that point (in addition

to the textbook readings for that week). There are no pre-lab quizzes - **it is up to each student to keep up with the material and be prepared to ask and answer questions during their scheduled lab.** Online lab sessions will provide further background information and elaborate on the material seen in the video, followed by a question & answer period.

4. **Working in teams:** All students are expected to hand in independent lab reports. The week before break week, teams of 6-7 will announced and will negotiate and sign the terms of a team charter. At the conclusion of classes the final anonymous distribution of effort evaluations of team members will be completed. This final evaluation is done individually and will be used to assess individual grades based on the team mark and each student's level of effort over the semester, as judged by their teammates. Individual student grades may go UP or DOWN, relative to the group grade, and within a specified range. As with work-place teams (which are the norm, even if you are a CEO), the development of an effective team requires effort, communication and skill but results in a synergy that leads to performance, creativity and productivity that are superior to what a single member working alone can accomplish.
5. **Lecture delivery and preparedness:** Lectures will be delivered asynchronously in the form of lecture videos and posted to the CourseLink Content page before the beginning of the week. In order to get the most out of these videos, students should have done the assigned readings using the associated reading guide. Names, terms and definitions for which you will be responsible but which will not be directly covered in class will be identified in those reading guides; they are described in the textbook and often in the introductions to the various laboratory exercises as well. There are no reading quizzes, and you are not expected to take copious notes on your readings! Take notes directly on the associated reading guide (using that as your guide) and on the slides for the posted lecture video. **It is up to each student to keep up with the material and be prepared to participate in group and class discussions during the scheduled Zoom class (i.e. office hour) time**. Topic quizzes are non-cumulative, are scheduled every 2 weeks, opening Mondays at 9:00AM (EST) for a 24h window and a 2h time limit.
6. **Topic review & application:** Each scheduled class time will be held online via ZOOM and used to discuss course concepts and comprehension as determined through application of those concepts to problems and polling questions, and that week's Syllabus Topic quiz. These are essentially a non-mandatory group office hour/review session. Details to join the meeting each week will be posted

on CourseLink. Students are welcome to listen in or actively participate, and will earn Curriculum Engagement marks for responding to 80% of the polls during that session. Individual appointments may be made to speak with Dr. Keenleyside, however questions or difficulties re. course material should **first** be addressed during the scheduled lecture time, and/or through the **discussion board** . Once students are assigned to their case study teams, their team members will become an additional resource.

7. **Remote learning and technical difficulties:** It is the students responsibility to ensure the proper functioning of their devices with all platforms used within the course. Efforts will be made to aide if issues arise but accommodations (i.e. extra time) cannot be guaranteed. Should technical difficulties arise while using LOCKDOWN BROWSER, students are to email CourseLink help (courselink@uoguelph.ca) and CC Dr. Keenleyside on their email.
8. **Time zones:** All times throughout the course will be given in **Eastern Time**. Students in differing time zones should take care to ensure they know the corresponding time in their current time zone.

8 Department of Molecular and Cellular Biology Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising or Program Counsellors

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. http://www.learningcommons.uoguelph.ca/

- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help and http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. https://www.uoguelph.ca/counselling/
- Student Health Services is located on campus and is available to provide medical attention. https://www.uoguelph.ca/studenthealthservices/clinic
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. http://www.selfregulationskills.ca/

8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/index.html. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar. (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml)

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for

Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance

and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website
https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website
https://www.ridgetownc.com/services/accessibilityservices.cfm

9.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

9.10 Illness

The University will not normally require verification of illness (doctor's notes) for fall 2020 or winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.
