MICR*2430 Methods in Microbial Culture and Physiology

Fall 2021
Section(s): C01

Department of Molecular and Cellular Biology
Credit Weight: 0.50
Version 5.00 - September 10, 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 **flipped** format. Students will watch lecture videos and do textbook readings prior to the Tuesday seminar. During class, students will work in groups, using problem-based learning to clarify and deepen their understanding of the concepts. During this group work, social distancing regulations will be suspended, however all other safety protocols will be enforced. Lab exercises and a team-based case study will further develop comprehension.

Recognizing that we've all struggled, academically and personally, during the pandemic, and that those struggles are on-going, my goal is to help you learn and foster your curiosity about this field, while maintaining a focus on kindness, empathy and flexibility throughout the semester. We're all in this together, and it is my hope we will be able to work as a team, so that we are ALL successful and finish the semester strong, rather than feeling like we're limping to the finish line! To that end, the following strategies will be used:

1. Class recordings: whether in-person or remote, will be recorded, edited and posted for streaming by the next day. Streaming from Microsoft Stream can be used for closed-captioning.
2. Labs: these are being taught F2F because of the importance of learning the skills and safety measures required when working with microorganisms. To help ensure everyone remains safe and healthy, students will work individually, rather than in pairs, and **students who are feeling ill** are asked to contact Amanda and remain home. Alternate arrangements will be made.
3. Keeping track: given the flipped nature of this course, as well as the required flexibility this particular semester requires, weekly tasks as well as their estimated "time to completion" will be itemized in advance (when possible), using the **Checklist** function of Courselink, **Courselink Announcements**, e-mails when necessary, as well as **Courselink Discussion Forums** for different course components. Dr. K. will check the latter daily.
4. Topic quizzes: non-cumulative, online, open for 24h with >3x the required time limit. Best 4 of 5.
5. **Assessments, due dates, and grading schemes will have built-in flexibility.**

1.3 Timetable

1. Seminar: Tues. 1:00 - 2:20 pm ***via*** Zoom in September, the F2F in MCKN 29
2. Labs: Mon, Tues, Wed, 2:30 - 5:20, Thurs, Fri 1:30-4:20

    - Labs begin Mon. Sept 13th

Given the possibility of a 4th wave, individual breakthrough infections, and post-exposure quarantines, one or more of the in-person course components may move to an online only format at any point in the semester.

1.4 Final Exam

Dec. 13, 11:30 am-1:30 pm. Location tba

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2 Instructional Support

2.1 Instructional Support Team

Instructor: Wendy Keenleyside Ph.D.
Email: wkeenley@uoguelph.ca
Telephone: +1-519-824-4120 x53813
Office: SSC 3506

- She/her

Lab Co-ordinator: Amanda van der Vinne M.Sc.
Email: avander@uoguelph.ca
Office: Virtual
Office Hours: As per Covid protocol, there will be no face to face meetings. The best way to have your questions answered is the discussion board on Courselink. If you require a meeting please email Amanda to arrange a virtual meeting.

2.2 Teaching Assistants

Teaching Assistant (GTA): Bradley Davis
Email: bdavis09@uoguelph.ca

Teaching Assistant (GTA): Allison Leonard
Email: aleona03@uoguelph.ca

- she/her

Teaching Assistant (GTA): Avery Robinson
Email: arobin17@uoguelph.ca

- she/her

Teaching Assistant (GTA): MacKenzie Verhoef
Email: verhoefm@uoguelph.ca

- she/her

Teaching Assistant (GTA): Victoria Wilson
Email: vwilso01@uoguelph.ca

- she/her

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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 and MICR2430.**
- **This is an Open Education Resource (OER): the e-book is free.**

Laboratory Manual (Lab Manual)
Bound hard-copy manual is required. Lab report sheets may be downloaded from Courselink.

Courselink (Website)
https://courselink.uoguelph.ca
The course website will be used extensively and will include all relevant course materials, including lecture videos, some online lab and case study materials, online syllabus topic quizzes, discussion boards, links for additional readings, group drop boxes, course calendar and weekly checklists, 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
Group office hours 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.

PeerWise (Website)
https://peerwise.cs.auckland.ac.nz/docs/
This is a free online tool for authoring, answering, commenting on and rating student-authored multiple-choice questions. A site for MICR*2430 F21 will be set up and the class

list imported. You will need to create an account (assuming you have not used the tool before) and then select the course. The tool is simple to use but instructions for creating, and for answering, questions, are provided in text as well as video on the PeerWise site. Dr. K. will provide some introductory/review questions to the MICR*2430 repository, to help you get started and seminar 1 will include a brief discussion of Bloom's taxonomy and what makes good, higher level MCQs. Any good quality, higher Bloom's level questions will be considered for inclusion in the final exam, with no upper limit! So you will derive double benefits from authoring and answering/providing feedback on, other questions: you will be learning as you do both, and you raise the likelihood that you will know some questions AND THEIR ANSWERS on the midterm and final exam! Students may earn participation marks for their questions.

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.

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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).

- **Content-related** learning outcomes will be posted separately on Courselink, and regularly updated. The content-related LOs all fall under 1 or more of the Course Learning Outcomes identified in section 4.1. The latter can be viewed as

overarching descriptions of the course's scope, while the former are offering-specific, to be used by the intructor AND students when setting/writing and grading the various assessments.

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. Successfully design and explain experiments for the isolation, identification and enumeration of microbes or assess such proposals
9. Perform experiments using appropriate safety precautions, and microbiological techniques for the isolation, identification and enumeration of representative groups of bacteria and fungi
10. Use appropriate and accurate mathematical calculations and statistical analyses and assess the reliability of data using biological and technical replicates
11. Successfully interpret and communicate scientific data in laboratory reports, group assignments and tests
12. 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

13. 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

5.1 Lecture

Tue, Sep 14, 1:00 PM - 2:20 PM

Topics:

Introduction to course & active learning format.

Topic 1: Growth in the environment & lab. Group & class discussions on "From ecosystems to media".

References:

Topic 1 lecture video:

1. *From ecosystems to media (~25 min)*

Microbiology: Canadian Edition Sec. 4.1 & 9.3, (review of revelant previous concepts 1.2-1.3, 7.1-7.4) & lab manual

Tue, Sep 21, 1:00 PM - 2:20 PM

Topics:

Topic 1: Growth in the environment & lab - conclusion. Group & class discussions on "Nutrients" & "Autotrophy/diazotrophy".

References:

Topic 1 lecture videos:

1. *Nutrients (~33 min)*
2. *Autotrophy/diazotrophy (~18min)*

Microbiology: Canadian Edition Sec. 9.3 & lab manual

Tue, Sep 28, 1:00 PM - 2:20 PM

Topics: **Post-quiz review - topic 1**

Introduction to Topic 2: Growth kinetics & enumeration

References: **Topic 2 lecture videos:**

1. *Bacterial cultures & growth curves (~13.5 min)*
2. *Bacterial enumeration (19 min)*

Microbiology: Canadian Edition Sec. 9.2 & lab manual

Tue, Oct 5, 1:00 PM - 2:20 PM

Topics: **Topic 2: Growth kinetics & enumeration.** Group & class discussions

Introduction to Topic 3: Cell membrane & transport

References: **Topic 3 lecture videos:**

1. *Bacterial cell wall & passive transport (~24 min)*
2. *Introduction to active transport (19 min)*

Microbiology: Canadian Edition Sec. 3.3 & lab manual

Tue, Oct 12

Topics: Thanksgiving Break - No new lecture material this week

Tue, Oct 19, 1:00 PM - 2:20 PM

Topics: **Post-quiz review - topic 2**

Topic 3: The cell membrane and transport - conclusion. Group & class discussions

Introduction to topic 4: The influence of environment on growth

References:

Topic 3 lecture video

1. *Active transport: ABC & PTS (~23 min)*

Topic 4 lecture videos:

1. *Environmental influences: O_2 & temp (35 min)*

Microbiology: Canadian Edition Sec. 3.3; 9.4, 9.6 (review 7.3-7.4) & lab manual

Tue, Oct 26, 1:00 PM - 2:20 PM

Topics:

Post-quiz review - topic 3

Topic 4: The influence of environment on growth. Group & class discussions

References:

Topic 4 lecture videos:

1. *Adaptation to pH (~31 min)*
2. *Adaptation to osmotic stress (14 min)*

Microbiology: Canadian Edition 9.5, 9.7 (review 3.3, 7.4), lab manual & case study

Tue, Nov 2, 1:00 PM - 2:20 PM

Topics:

Topic 4: The influence of environment on growth - conclusion. Group & class discussions

Introduction to Topic 5: The biochemistry of catabolism.

References:

Topic 5 lecture videos:

1. *Central pathways (~36 min)*
2. *Introduction to fermentation & redox potentials (19 min)*

Microbiology: Canadian Edition Ch. 8 intro, Sec. 8.1, 8.2, 8.4 & lab manual

Tue, Nov 9, 1:00 PM - 2:20 PM

Topics:

Post-quiz review - topic 4

Topic 5: The biochemistry of catabolism. Group & class discussions

References:

Lecture videos:

1. *Redox & the electron transport chain (~30 min)*
2. *Primary & secondary fermentation (~13 min)*

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

Tue, Nov 16, 1:00 PM - 2:20 PM

Topics:

Topic 5: The biochemistry of catabolism - conclusion. Group & class discussions

Introduction to topic 6: Microbial diversity & ecology

References:

Lecture video:

1. *Heterotrophs vs lithotrophs (~24 min)*

Microbiology: Canadian Edition Sec. 8.6, lab manual/case study

Tue, Nov 23, 1:00 PM - 2:20 PM

Topics: **Post-quiz review - topic 5**

Topic 6: Microbial diversity & ecology. Group & class discussions

References: **Lecture video:**

1. *Phototrophs & the ETC (~27 min)*

Microbiology: Canadian Edition Sec. 8.7, 9.1, 10.1, 10.6, case study

Tue, Nov 30, 1:00 PM - 2:20 PM

Topics: **Topic 6: Microbial diversity & ecology - conclusion.** Group & class discussions

References: Sec. 8.1, 8.3, 8.6-8.7, 10.1, 10.6 & Case study

Thu, Dec 2, 1:00 PM - 2:20 PM

Topics: (Make-up class for fall break day.)

Ch. 3 team quiz; review

References: Sec. 8.1, 8.3, 8.6-8.7, 10.1, 10.6 & Case study

5.2 Course Content: Labs

Week	**Lab Topic**	**Readings**
Sept 13 - 17	Exp. 1 - Review of techniques	Laboratory 1
Sept 20-24	Exp. 1 results from review Exp. 1 - Soil microbiology Exp. 2 - Bacterial Physiological Diversity	Laboratory 1 & 2
Sept 27 - Oct 1	Exp 1. results Exp. 2 Continue Exp. 3 - Comparative counting	Laboratory 3
Oct 4 - 8	Due to Dropbox: Report 1 Exp. 2 results Exp. 3 results Exp. 4 - Growth curve (online)	Laboratory 4
Oct 18 - 22	Due to dropbox: Reports 2-4 Exp. 5 – Biochemical tests Introduction to case study & case study teams	Laboratory 5 & Case Study - Introduction to the Winogradsky Columns

Week	**Lab Topic**	**Readings**
	- Assign Case study Ch. 1 questions	
Oct 25 - 29	Due to dropbox: Team charter Exp. 5 results Exp. 6 – Antimicrobials Ch 1 lab (virtual results)	Laboratory 6 Case Study Ch. 1 & Ch. 1 readings
Nov 1-5	Due to dropbox: Reports 5 & Ch. 1 questions Exp. 6 results Ch. 1 team quiz Assign Ch. 2 questions	Case Study Ch. 1 & Ch. 1 readings
Nov 8 - 12	Due to dropbox: Report 6 & Team effectiveness feedback summary Ch. 2 lab (virtual results)	Case Study Ch. 2 & Ch. 2 readings
Nov 15 - 19	Due to **PEARTool**: Ch. 2 draft answers Ch. 2 team quiz #1 Assign Ch. 3 questions	Case Study Ch. 2 & Ch. 2 readings

Week	Lab Topic	Readings
Nov 22 - 26	Due to **PEARTool**: Ch. 2 reviews Ch. 2 team quiz #2	Case Study Ch. 1 & Ch. 1 readings
No labs Nov 29 - Dec 2	Due to dropbox: Ch. 2 & ch. 3 final answers Ch. 3 quiz in Dec. 2 make-up lecture	Case Study Ch. 3 & Ch. 3 readings

- Case study readings are given in the case study, published in the course manual. Other readings are provided via link or pdf on Courselink

5.3 Method of Presentation

Students will learn the techniques and concepts through face-to-face seminars & lab sessions (YAY!!!) and will use a combination of independent reading, lecture videos, laboratory activities, group/team discussions and team work in an interactive case study and collaborative tests/test questions. **Simple concepts and definitions will be itemized in weekly reading guides and covered through independent reading, laboratory exercise introductions, but will not be covered during class.**

5.4 Teamwork

This is a major component of the course due to the documented advantages of peer discussion and instruction to facilitate deeper learning, as well as being a critical skill in the workplace. Case Study groups of students will be formed. They will work together in the online lab sections and outside of class/lab time on the case study. Teams will be constructed following best practices, using student answers to a survey. Team member accountability will be ensured through an initial "Team Charter" and finally, through anonymous peer evaluations using the UofG PEARTool. The average scores from those anonymous assessments will be used to assign individual case study grades from the team grade.

6 Assessments

In W21, as a response to the ongoing pandemic and ensuing trauma, the number of traditional assessments for this course was reduced. Pre-lab quizzes, lecture reading quizzes and the single midterm exam were all eliminated. New to that semester were 5 **non-cumulative** syllabus topic online quizzes. This semester, although returning to campus, we will continue with that approach, and despite having in-person labs, are additionally eliminating in-lab quizzes, the bell-ringer lab test, and lab skills tests.

It is hoped that student work-loads and stress levels will be reduced as a result of these changes. However, note that the reduction in multiple weekly, small-stakes quizzes, and cumulative, bigger stake midterm and lab test, also means that it is entirely the student's responsibility to keep up with the assigned readings and content. The final exam **IS** cumulative and includes lab-related material, 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.

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 (quiz grade is best 4 of 5).

6.1 Marking Schemes & Distributions

Syllabus topic quizzes are best 4/5. Students who do better on the final exam will have the grade weight for the quizzes transferred to the final. Students unable to complete 4 of the 5 quizzes may, at the instructor's discretion, be given an alternative assignment OR have the quiz grade weight transferred to the final exam.

Name	Scheme A (%)	Scheme B (%)
Syllabus topic quizzes	20	0
Lab reports	20	20
Case study	15	15
Participation	5	5
Final exam	40	60
Total	100	100

6.2 Assessment Details

Syllabus topic quizzes (20%)
Date: , Online
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 10, 11

Short non-cumulative quizzes, consisting of multiple T/F statements that assess the ability to apply and interpret; these will include any directly related material **from labs completed to-date.**

The quizzes 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). All but the second quiz open on a Monday**. The topic 2 quiz window opens on 9:00am Thursday following the Thanksgiving-fall break.**

1. **Sept. 27-28**, 2021 - Growth in the Environment and Lab
2. **Oct. 14-15** (Thurs.-Fri. following fall break), 2021 - Growth Kinetics and Enumeration
3. **Oct. 25-26**, 2021 - The Cell Membrane and Transport
4. **Nov. 8-9**, 2021 - Influence of the Environment on Microbial Growth
5. **Nov. 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 seminar 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 weekly 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 1-6
Learning Outcome: 2, 7, 8, 9, 10, 11, 13
Reports are submitted to Dropbox on Courselink by 12:00 p.m. (noon) Eastern Time, on your scheduled lab day, the week immediately following conclusion (collection of results) of that lab exercise. Unless academic accommodation is being provided, late reports will lose 10% per day

Case study (15%)

Date: Fri, Nov 6 - Mon, Dec 7, In lab, online and outside of lab time
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13
Various small dropbox or PEARTool due dates associated with preliminary work for each of 3 chapters.

Chapter quizzes are written by teams during lab time, using IF-AT cards ("scratch & win cards); if lab sessions are virtual for some reason, an alternative online format will be used, with teams discussing the questions and answers through Zoom break-out rooms. The instructor and TAs may help guide team discussions when deadlocked or running off-track.

1. Chapter 1 - **Nov. 1-5**
2. Chapter 2 - **Nov. 15-19 (**1st attempt) & **Nov. 22-26** (2nd attempt)
3. Chapter 3 - **Dec. 2**

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

Participation (5%)

Date: Tue, Sep 21 - Thu, Dec 2
Learning Outcome: 12, 13
The scheduled lecture slot will be used for active learning of concepts, using a combination of group work on problems, polling and class discussions. In classes that precede a syllabus topic quiz, this will provide formative feedback on comprehension; in classes that immediately follow a syllabus topic quiz, this will help clarify and correct any misconceptions. Students who are feeling unwell are asked to contact Dr. K. and to NOT attend F2F class(es) - participation marks will not be affected.

- **Polling:** students will be polled multiple times per class (using Zoom or Mentimeter - free platform tbd), using a variety of question formats (multiple-choice, multi select, targeting, word clouds). Students receive one mark per response and their grade is determined by the percentage of questions answered versus 95% of the total questions polled: grade = (#student polls/#total polls x 0.95)
- **Random calling:** in order to increase accessibility, break down barriers and develop a sense of community, the instructor will use a randomized classlist to solicit feedback from group discussions. Students receive one point per response. Those who are absent from class when their name is called will be cycled to the top of the list for the following class.

Final exam (40%)
Date: Mon, Dec 13, 11:30 AM - 1:30 PM
Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
In person, [a]2-stage. Location tba

- Cumulative including lecture content, textbook readings, lab and case study material
- MCQs, matching, multiple T/F & short answer with choice
- A take-home component will be provided at least a week prior to the exam. Students may collaborate on this, however they must **learn** the answer as they will be required to answer the question in the individual stage of the exam.
- 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 1-6 and the case study questions.

[a]**2-stage exam**: the length of the first (individual) stage will be shortened to allow for a second group stage. During the second stage, case study teams will work together to reach consensus on a subset of questions from the individual stage. Grade is calculated to give the highest possible, using either of the following:

1. Only the individual portion of the exam
2. Both stages of the exam combined (85% + 15%)
3. Individual plus the class average from the second stage (when a student is unable to participate in the second stage[b]; 85% + 15%)

[b] Students registered with SAS should identify themselves to Dr. K. in order to discuss the possibility of beginning the individual exam **early**, in order to then participate with their team on the second stage

6.3 Bonus marks

Students may earn **up to 5% bonus marks** through the following:

1. Authoring 10 or more questions on PEERWise (each is worth 0.5 marks)
2. Answering 20 or more questions on PEERWise (each is with 0.25 marks)
3. Doing all 6 of the Courselink practice quizzes

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7 Course Statements

7.1 Grading

1. **Syllabus topic quizzes** - best 4 of 5. 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 final exam, the total quiz grade will be dropped and the grade weight transferred to the final exam.
2. **Bonus activities** - students may supplement lost classroom polling or random calling marks through authoring, and/or answering, questions on PEERWise, and/or by doing all 6 of the practice topic quizzes on Courselink.
3. **Assignments/reports** – lab reports are due by 12:00 pm (noon) Eastern Time on the lab day following conclusion of the respective lab exercise; the details for case study submissions are described in the **"Introduction to the case study"**, on Courselink. For lab reports, absent academic accommodation, deductions for late submissions will be 10% per day. For the case study submissions, marks may be deducted, and any deductions will be applied to the **Team grade.** Problems regarding lab report submissions should be discussed with Amanda (**avander@uoguelph.ca**) and for the case study, with Dr. K. (**wkeenley@uoguelph.ca**).

7.2 Emails

1. Pease only use your UofG e-mail account.
2. All questions related to Course/Lab Content should first be posted to the Discussion board on Courselink. Dr. K. and Amanda will regularly check and respond to those posts, allowing the rest of the class to see the answers.
3. E-mails regarding personal concerns will be prioritized - we're here to help and support you!
4. If you feel you need help with your learning/study skills, please e-mail Dr. K!
5. Questions about any of the online quiz questions will not be answered until after the quiz closes for everyone.
6. Please be patient - replies to e-mails sent outside of regular weekday hours (9 am-5 pm Eastern Time) may take 24-48h.
7. Use email for personal issues.

7.3 Student Responsibilities

1. **Respectfulness:** let's all do our part to create an environment of mutual respect. In class, this means paying attention, not talking while the instructor or another student is talking, not sending or receiving text messages or phone calls once class has started.
2. **Lab attendance**. **If you are feeling unwell**, you are asked to e-mail the lab coordinator (avander@uoguelph.ca) and stay home: a virtual alternative will be provided. Learning these skills is critical for your education (and safety!), so as long as you are healthy, attendance is mandatory and attendance will be taken at each lab period. STUDENTS WILL ONLY BE PERMITTED TO ATTEND THEIR LAB SECTION, as shown on web advisor.
3. **Laboratory preparedness:** You must have read the relevant laboratory exercise in advance of the lab and watched the online lab demonstration videos, prior to attending the lab section. Flow charts for what you will be doing in the lab are encouraged - these will help organize your tasks and ensure you finish in less than the scheduled 3h. You must bring with you: closed-toed shoes, a lab coat, your lab manual, an elastic band for long hair, and a notebook. If you wear contact lenses, you must also bring safety glasses.
4. **Working in teams:** For this semester, lab work will be completed independently. Mid-semester, case study teams of ~6 will be announced. These teams will discuss and collaborate on the development of a team charter. After completion of Chapter 1, teams will discuss and provide preliminary feedback

("Team Effectiveness Feedback") on their functioning and determine areas for improvement. Upon completion, team members will assign anonymous scores for the distribution of effort among team mates. The average scores will be used to assess individual grades based on the team mark. An individual's grade may go UP or DOWN, relative to the group grade, within limits. 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 is a learned and critical skill: it results in a synergy that leads to performance, creativity and productivity that are superior to what a single member working alone can accomplish.

5. **Seminar preparedness:** Seminars are highly interactive. In order to arrive prepared, you must have done the assigned readings and watched the lecture video(s). To help you keep track of these, use the checklist of weekly tasks. Names, terms and definitions for which you will be responsible but which will not be directly covered in class are identified in weekly reading guides (posted in "Learning tool" under content on Courselink), and are covered in the textbook and generally in the introductions to the various laboratory exercises.
6. **Classroom polling:** students are expected to resolve any connectivity issues with their device immediately. These issues are generally due to either: a problem with the wireless function of the device, losing the signal from the router (in which case disconnecting and reconnecting your device will allow you to access the first available router, so will allow you to reconnect more quickly) or interference with bluetooth signals (students will be asked to turn off their bluetooth function(s) at the beginning of class). Unless a student is absent for an extended period due to medical, psychological or compassionate reasons, **marks for missed polls are to be made up through the identified bonus activities.**

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)

8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

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, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. 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

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
