



MICR*3420 Microbial Diversity and Ecology

Fall 2023

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - September 07, 2023

1 Course Details

1.1 Calendar Description

The cycling of elements (carbon, nitrogen, sulphur) within ecosystems involves the contributions of diverse microorganisms. This course will study the diversity of predominantly Bacteria and Archaea in selected ecosystems at an organismal level, investigate the metabolic and enzymatic diversity in microbes that contribute to and thrive within these environments, and examine the methodologies used to study the relationships and evolution of microorganisms within an ecosystem.

Pre-Requisites: BIOC*3560, MBG*2040, MICR*2430

1.2 Course Description

This course is designed to be highly interactive. Classes will include problem-based learning using group/team & class discussions, and detailed class analyses and discussions of assigned journal articles (generally 1 article *per* topic). The goal is NOT memorization, but comprehension and application (the latter is highly dependent upon the former) and to develop your ability to read and understand the literature. There is also a team project which students will primarily work on outside of class.

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. To that end, the following strategies will be used:

1. **Recordings:** While classes are designed to be interactive and most beneficial with in-person attendance, ALL classes will be recorded, edited and posted for streaming by the next day. Videos are uploaded to Microsoft Stream, enabling closed-captioning.

2. **Quizzes:** *in lieu* of a midterm, there will be a total of 3 SHORT non-cumulative quizzes, with question choice, and your grade will come from the best 2 of these. These will be written on the last Friday of each month, *in class*, and time for completion estimated @ 15-20 min. ALL students will have until the end of class for completion, but may leave when done. Answers will be posted after the grading is completed, and areas of difficulty identified by the quiz will be reviewed during the Monday class immediately following the quiz.
3. **Keeping on track:** the **Courselink Calendar** contains all the dropbox and assessment due dates. In addition, **Courselink Discussion Forums** have been created for different course components, providing an efficient way of disseminating answers to questions - Dr. K. will check these daily.
4. **Assumed knowledge:** this course builds on what you learned in MICR*2430, beginning with the first topic: **Microbial Metabolism & Biogeochemical Cycling**. The first assigned readings are Ch. 8 & Sec. 10.3 of the "*Microbiology: Canadian Edition*" by Keenleyside *et al.* (the same open-resource textbook used in MICR*2430). Relevant textbook references for other assumed knowledge from core courses (BIOL*1070, MICR*2420, MBG*2040, MCB*2050) are provided in this course outline in section 5.1. Some review "homework" is also posted on Courselink.
5. **Optimizing your performance:** For students who are struggling with the content, Dr. K. is always available to discuss how you can improve, including: strategies for keeping on top of the material; reading and comprehension of the assigned articles; strategies for learning; strategies for effective test-writing. In addition, because the grade weight of the quizzes will be transferred to the final if students perform better on the latter, and also because the exam is the ONLY cumulative assessment, students who struggle in the first 2 quizzes will receive an e-mail invitation from Dr. K. to meet and determine ways to improve performance prior to the final exam.
6. **Assigned readings:** these are from the primary and secondary literature and are assigned as learning tools for the course content and to develop your ability to read and understand the literature. To accomplish this, we will be working interacting in groups of ~12 through the social annotation tool, Perusall. A full class will subsequently be dedicated to critical discussion of each reading. Most readings relate to more than 1 topic, so will be revisited when relevant, to further develop your comprehension.
7. **Assessments, due dates, and grading schemes all have built-in flexibility:** in particular, everyone has two free passes for a 48h extension. Note these are to be used for medical, psychological or compassionate reasons, but require no documentation or explanations, just advance notice to Dr. K. These passes cannot be used for team project deadlines.

1.3 Timetable

In person classes:

M, W, F, 10:30-11:20 am - MCKN 226

1.4 Final Exam

In person: Dec. 11, 8:30-10:30 AM.

- 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
Office Hours:	Please e-mail for individual appointments. These may be in person, or through Teams.

- She/Her
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3 Learning Resources

3.1 Required Resources

Microbiology: Canadian Edition (Textbook)

<https://ecampusontario.pressbooks.pub/microbio/front-matter/preface/>

- By Keenleyside *et al.* Adapted from Microbiology by Openstax. This is an Open Education Resource (OER): the e-book is free.
- This book provides basic background and review, and will be particularly helpful for reviewing concepts from MICR*2430 which will be assumed knowledge: of particular importance are the sections on microbial metabolism (redox, heterotrophy, lithotrophy, phototrophy, anaerobic respiration, fermentation, methanogenesis and biogeochemical cycling).

Courselink (Website)

<https://courselink.uoguelph.ca>

Additional materials will be posted on Courselink.

You are expected to check the site regularly for updates and information.

Perusall (Website)

<https://www.perusall.com>

This is a free platform for group annotation of assigned readings. A site has been created for this course and the readings imported. Student groups will annotate, pose questions, answer each other's questions and even upvote other student's annotations.

Zoom (Website)

<https://zoom.us/join#/login>

This will be accessed through courselink and will not be used for grades, but to encourage engagement and provide formative feedback.

PEARTool (Website)

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

This is an open education resource developed at the University of Guelph, for Peer Evaluation, Assessment and Review. This will be used for team members' assessments of the distribution of effort at the end of the semester.

3.2 Recommended Resources

LPSN - List of Prokaryotic Names with Standing in Nomenclature (Website)

<https://www.bacterio.net>

List of Prokaryotic Names with Standing in Nomenclature

Most recent:

Parte, A.C., Sardà Carbasse, J., Meier-Kolthoff, J.P., Reimer, L.C. and Göker, M. (2020). List of Prokaryotic names with Standing in Nomenclature (LPSN) moves to the DSMZ. *International Journal of Systematic and Evolutionary Microbiology*, **70**, 5607-5612; DOI: 10.1099/ijsem.0.004332

- A regularly updated list of all bacterial names that have standing in nomenclature.
- Warning: Content is Biological Material and as such is subject to mutation, evolution and CHANGE

Bergey's manual of systematics of Archaea and Bacteria (Other)

"**Bergey's manual of systematics of Archaea and Bacteria**" (2015). Whitman, William Barnaby, editor.

- This is an electronic library resource, accessible through the University of Guelph Library
 - Descriptions of the taxonomy, systematics, ecology, physiology, etc. of all named prokaryotic taxa.
 - E-book replaces 5-volume 2nd second edition (Bergey's Manual of Systematic Bacteriology) completed in 2012.
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4 Learning Outcomes

Learning goals and rationale: To develop a detailed understanding of the critical role, and evolutionary underpinnings of, microorganisms and microbiomes in biosphere function and planetary health, the intricacies of microbial communities, the methods for studying them and the ethical considerations of microbiome studies and modifications. The course is intended to build on concepts introduced in the 2000-level microbiology courses.

- **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 instructor AND students when setting/learning and grading the various assessments.

4.1 Course Learning Outcomes

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

1. Describe, with specific examples, the metabolic diversity of the microbes, in particular the bacteria & archaea, and their central roles in the major biogeochemical cycles
 2. Explain, assess and propose, culture-dependent and independent methods for characterizing microbial function, diversity and community structure.
 3. Describe methods for determining microbial phylogeny and taxonomy and discuss the debate relating to the species concept for bacteria & archaea
 4. Describe the concepts of microbiomes and holobionts, and with specific examples, the critical roles of microbes in human and planetary health.
 5. Discuss the concept of microbial dark matter, the implications and ethical considerations of our evolving ability to characterize the uncultivated
 6. Critically read, analyze and discuss the primary and secondary literature.
 7. Further develop your metacognitive skills, as well as your team skills, through honest reflections, respectful communication and cooperation.
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5 Teaching and Learning Activities

Slides: pared down slides will be posted the day before scheduled classes to facilitate note-taking, and critical discussions. A complete slide deck will be uploaded following class.

Assigned readings: each topic has at least one assigned reading from the primary or secondary literature; a later topic has two. The first topic, which picks up where MICR*2430 left off includes assigned reading from "Microbiology: Canadian Edition" - the OER textbook used in MICR*2430. Using the social annotation platform Perusall and working in groups of ~15, students will read and annotate each assigned reading before the class in which that article will be critically discussed. In some cases, an article will **introduce** a concept directly related to a previous topic, in addition to introducing concept(s) related to the current topic.

Class recordings: all classes will be recorded, edited, and made available for streaming from Courselink (using Microsoft Stream), usually within 24h.

Non-cumulative quizzes: in-class, the **last Friday of each month** (weeks 3, 7, 11). The following Monday is scheduled as a **Quiz debrief:** a review of problem areas identified by the quiz.

Note: the exact beginning and end of topics, as identified below, is subject to minor change

5.1 Lecture

Fri, Sep 8, 10:30 AM - 11:00 AM

Topics: **Introduction to the course and to each other!**

Week 1

Topics: **Topic 1: Microbial metabolism & biogeochemical cycling**

References: Reading #1 and your annotations must be completed **before Friday's class** -

- **Assigned Reading #1:** *Microbiology: Canadian Edition*
Ch. 8 (Microbial Catabolism) & **Sec. 10.3**
(Methanogens & Syntrophy)

Week 2

Topics: **Topic 1 (M, W)** - continued (Microbial metabolism & biogeochemical cycling)

Topic 2 (F) - Techniques in microbial ecology

References:

Reading #2 combines the first topic with an introduction to the second. Annotations must be completed

BEFORE Friday's class -

- **Assigned reading #2:** Imachi, H., Nobu, M. K., Nakahara, N., Morono, Y., Ogawara, M., Takaki, Y., Takano, Y., Uematsu, K., Ikuta, T., Ito, M., Matsui, Y., Miyazaki, M., Murata, K., Saito, Y., Sakai, S., Song, C., Tasumi, E., Yamanaka, Y., Yamaguchi, T., Kamagata, Y., ... Takai, K. (2020). **Isolation of an archaeon at the prokaryote-eukaryote interface.** *Nature*, 577(7791), 519–525.

Week 3

Topics:

Topic 2 (M-W): continued (Techniques in Microbial Ecology)

Friday - quiz #1

References:

Assumed knowledge from previous courses: microbial cultivation, including enrichment, the structure of DNA, RNA and proteins, basic concepts in DNA replication, transcription and translation in prokaryotes, PCR

The following sections from "*Microbiology: Canadian Edition*" provide a review - **Ch. 9** (Microbial Growth & Biosynthesis), **Sec. 10.1** (Microbial Ecology & Metagenomics), **Ch. 12** (Mechanisms of Microbial Genetics) & Ch. 13 (Modern Application of Microbial Genetics) **Sec. 13.1 & 13.2**

Week 4

Topics:

Monday: Quiz #1 debrief

Wed.-Fri. - Topic 2 - continued (Techniques in Microbial Ecology)

References:

Reading #3 with your annotations must be completed **BEFORE Wednesday's class** -

- **Assigned reading #3:** Daims, H., Lebedeva, E. V., Pjevac, P., Han, P., Herbold, C., Albertsen, M., Jehmlich, N., Palatinszky, M., Vierheilig, J., Bulaev, A., Kirkegaard, R. H., von Bergen, M., Rattei, T., Bendinger, B., Nielsen, P. H., & Wagner, M. (2015). **Complete nitrification by *Nitrospira* bacteria.** *Nature*, 528(7583), 504–509.
- You will likely also find **Sec. 10.6** of the textbook (Biogeochemical cycles) helpful.

Week 5

Topics:

Topic 3: Phylogenetic Diversity of Bacteria & Archaea

- note: this is the week of Thanksgiving & the fall break day.

References:

Some of this builds on the concept of phylogenetic tress, covered in BIOL*1070, and MICR*2420. You may find **Sec. 1.2, Sec. 4.1** and **Sec. 4.6** from "*Microbiology: Canadian Edition*" provide a helpful review of introductory concepts.

Week 6

Topics:

Topic 3: continued (Phylogenetic Diversity of Bacterial & Archaea)

References:

Reading #4 and your annotations must be completed **BEFORE Monday's class** -

- **Assigned reading #4:** Gong, X., Del Río, Á. R., Xu, L., Chen, Z., Langwig, M. V., Su, L., Sun, M., Huerta-Cepas, J., De Anda, V., & Baker, B. J. (2022). **New globally distributed bacterial phyla within the FCB superphylum.** *Nature communications*, 13(1), 7516.

Week 7

Topics: **Topic 4 (M-W): Ecosystems & microbiomes**

Friday - quiz #2

References: Some of this builds on what you learned in MICR*2420 about the human microbiome. You may find **Sec. 4.1** and **Sec. 25.1** from "*Microbiology: Canadian Edition*" provide some review of introductory concepts

Week 8

Topics: **Monday:** Quiz #2 debrief

Wed. - Fri. Topic 4 continued (Ecosystems & microbiomes)

References: Reading #5 and your annotations must be completed **BEFORE Wednesday's class** -

- **Assigned reading #5:** Zhu, Y.-G., Zhu, D., Rillig, M.C., Yang, Y., Chu, H., Chen, Q.-L., Penuelas, J., Cui, H.-L. and Gillings, M. (2023). **Ecosystem Microbiome Science.** *mLife*, 2: 2-10.

Week 9

Topics: **Topic 4:** continued (Ecosystems & microbiomes)

References: Reading #6 and your annotations must be completed **BEFORE Friday's class** -

- **Assigned reading #6:** Rooney, A. M., Cochrane, K., Fedsin, S., Yao, S., Anwer, S., Dehmiwal, S., Hota, S., Poutanen, S., Allen-Vercoe, E., Coburn, B., & MTOP Investigators (2023). **A microbial consortium alters intestinal *Pseudomonadota* and antimicrobial resistance genes in individuals with recurrent *Clostridioides difficile* infection.** *mBio*, e0348222.

Week 10

Topics:

Topic 5: Microbiomes & Our Changing World

References:

Reading #7 and your annotations must be completed **BEFORE Friday's class** -

- **Assigned reading #7:** Lange, L., Berg, G., Cernava, T., Champomier-Vergès, M. C., Charles, T., Cocolin, L., Cotter, P., D'Hondt, K., Kostic, T., Maguin, E., Makhallanyane, T., Meisner, A., Ryan, M., Kiran, G. S., de Souza, R. S., Sanz, Y., Schloter, M., Smidt, H., Wakelin, S., & Sessitsch, A. (2022). **Microbiome ethics, guiding principles for microbiome research, use and knowledge management.** *Environmental microbiome*, 17(1), 50.

Week 11

Topics:

Topic 5 - continued (Microbiomes & Our Changing World)

Friday - quiz #3

Week 12

Topics:

Monday: Quiz #3 debrief

Wednesday: MiFF: Microbiology Film Festival - video viewing, peer review & voting

Friday: MiFF awards, exam review

References:

6 Assessments

The goal of the combined assessments is obviously to provide formative feedback on your abilities and comprehension, but also to help you learn the course material and further develop your learning, analytical, communication and team skills. Instead of a single, higher-stakes midterm, you will write a total of 3 short, **non-cumulative** quizzes on the last Friday of each month. These will be short-answer, written in class. The final exam **IS** cumulative, so as in MICR*2430, students will be expected to keep reviewing previously covered material. Assigned readings and their subsequent discussions should help, as the articles generally include content pertaining to more than 1 topic, so will be revisited where relevant. Students who do better on the final compared to the quizzes will automatically have the quiz grade weight transferred to the final exam.

6.1 Marking Schemes & Distributions

Grade weight automatically transferred to the final exam for those who perform better than on their quizzes. Those who miss more than 1 quiz will also automatically have the grade weight transferred to the final exam. In view of the cumulative nature of the final (vs the quizzes), students must be advised to **continually review their notes** to prepare for the final exam.

A maximum of 4.5% bonus marks may be earned by annotating all 7 assigned readings and submitting all 6 reflections.

Name	Scheme A (%)	Scheme B (%)
Reading summaries	21	21
Reflections	5	5
Quizzes	20	0
Team project	20	20
Final exam	34	54
Total	100	100

6.2 Assessment Details

Quizzes (20%)

Date: The last Friday of each month, In class

Learning Outcome: 1, 2, 3, 4, 5, 6

1. **Friday Sept. 29, 10:30-11:20**
2. **Friday Oct. 27, 10:30-11:20**
3. **Friday Nov. 24, 10:30-11:20**

- Non-cumulative: short, written questions, with choice. On the material from the previous 3-4 weeks, including relevant concepts from assigned readings.
- Best 2 of 3 (each is therefore worth 10% of your course grade).
- Estimated time for completion ~15-20 min. All students have the entire class to complete but may leave once done.

Reading Annotations (21%)

Date: Throughout the semester

Learning Outcome: 1, 2, 3, 4, 5, 6, 7

Using the free social annotation platform Perusall, student groups of ~12, will post questions or comments on content and answer or upvote other student's questions/comments. Each reading assignment is automatically graded using the associated AI and is marked based on making the deadline*, quantity, quality and distribution (i.e. not front-end, or back-end loaded) of the student's annotations as well as engaging with other student's comments. Grading scheme adds up to >100% so there are various ways students can earn full credit for each assignment.

The deadlines are all 9:00AM the day when the article is scheduled to be critically discussed. Perusall analytics will be used to guide subsequent class discussions, but these discussions will NOT be graded.

1. **Fri. Sept. 15**
2. **Fri. Sept. 22**
3. **Wed. Oct. 4**
4. **Mon. Oct. 16**
5. **Wed. Nov. 1**
6. **Fri. Nov. 10**
7. **Fri. Nov. 17**

* To avoid penalties for late submissions, students claiming one of their 48h free passes must notify Dr. K. in advance.

- best 6 of 7 (3.5% each)
- **Bonus marks:** completion of all 7 earns a maximum of 3.5 percent on this grade category, which will be allowed to exceed 100%
- The quizzes AND final exam will include questions related to the major aspects of

the assigned readings (as identified in the Content-specific learning outcomes on Courselink).

Team Research Assignment (20%)

Date: During the last 1/2 of the semester, Outside of class

Learning Outcome: 1, 2, 3, 4, 6, 7

The purpose of this assignment is: 1) to research and teach each other about some of the major groups of bacteria and archaea, 2) to learn about the process of taxonomy & nomenclature, and the associated challenges & controversies, 3) to generate possible content for a second edition of the OER textbook **Microbiology: Canadian Edition**, and 4) to further develop your research, communication and team skills. Teams of 4-5 will be created and held accountable to each other using the same strategy as in MICR2430 (team charter, team effectiveness feedback summary, assessment of distribution of effort among team members using PEARTool). Individual project grades will be assessed based on the (team grade) x average score (as %) from the team's distribution of effort assessments. Team creation will follow a similar process as in MICR*2430, using information from a short Qualtrics survey to create teams of diverse composition. The survey will be made available **Oct. 4**, and teams will be announced by **Oct. 16**. Each team will pick 1 bacterial or archaeal clade from among a selection provided. Working outside of class, teams will "drill down" to a genus or species of particular importance or interest from within that clade, submitting a 3 minute video, which will be screened in class, and a final fact sheet, which will be provided to class as study aids for a section of the final exam.

Timeline:

1. **Friday Oct. 13:** qualtrics survey for team-building due
2. **Monday Oct. 16** - teams announced
3. **Monday Oct. 23:** team charter due to dropbox
4. **Wednesday Nov. 8:** teams may submit to the dropbox, a 1-2 page draft description of "adopted" clade, with rationale. This is for instructor feedback and is not graded.
5. **Friday Nov. 10:** team effectiveness feedback summary due to dropbox
6. **Wednesday Nov. 29: Microbiology Film Festival (MiFF).** Teams will upload a 3 min. vignette (.mp4, akin to the "Hinterlands Who's Who" vignettes created by the Canadian Wildlife Federation and Environment and Climate Change Canada) to the dropbox. These will be screened in class and students will provide feedback and vote on their favourite video. Votes will be tallied and awards presented in the last class.
7. **Friday Dec. 1:** team Fact Sheets uploaded to dropbox. MiFF awards presented for 1st, 2nd & 3rd place based on student voting.
8. **Monday Dec. 4:** deadline for team member's distribution of effort scores (PEARTool)

The final exam will include a section where students select and describe specific aspects of **2-3** clades from the total collection of clades researched by the teams. The final vignettes and Fact Sheets will be made accessible to everyone on Courselink and will

provide the relevant content for that portion of the exam.

The list of clades that will be "up for adoption", as well as details on grading, and rubrics, will be provided separately.

Reflections (5%)

Date: Throughout the semester

Learning Outcome: 1, 2, 3, 4, 5, 6, 7

Reflections: a total of 5 (out of a possible 6) 1-page dropbox submissions, Due by Friday @ 11:59 PM*. These are of 2 types, worth 1 mark each, and graded based on evidence of good faith effort:

1. the week *prior* to a quiz, identifying any major conceptual problems you need to clarify, and how you plan on doing that, and/or how you plan on preparing for the quiz.
2. the week *following* a quiz, identifying any sources of difficulty with the quiz, any concepts you still need to clarify, and how you might adjust your learning strategies

* To avoid penalties for late submissions, students claiming one of their 48h free passes must notify Dr. K. in advance.

- **Bonus mark:** submission of all 6 reflections earns **1 bonus percent on this grade category, which will be allowed to exceed 100%**

Final exam (34%)

Date: Mon, Dec 11, 8:30 AM - 10:30 AM, tba

Learning Outcome: 1, 2, 3, 4, 5, 6

Cumulative including the assigned readings and fact sheets from the team project. Exam is entirely short-answer. Students will have some choice in the questions they choose to answer.

7 Course Statements

7.1 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 and not sending or receiving text messages or phone calls once class has

started. It also means responding in a timely fashion to e-mails from the instructor and from team mates.

2. **Engagement:** classes are designed to facilitate active learning, with regular opportunities for small group and class discussions, as well as periodic anonymous polling. While participation is not graded, and lectures will be recorded, students will derive the most benefit from attending and participating in lectures.
3. **Project teams:** team members will negotiate and sign the terms of a team charter and, after working together for a few weeks, individually fill out, then discuss as a group, their "Team Effectiveness Feedback" assessments. The team as a whole will use the individual results and their discussions to develop a summary and report agreed-upon steps for improving performance. As with work-place teams (which are generally the norm), the development of an effective team requires effort, communication, empathy and skill, but can result in a synergy that leads to superior creativity, productivity and overall quality, compared to what an individual can accomplish. Significant problems within a team should be identified and resolved as agreed in the Team Effectiveness Feedback Summary. If necessary (and as a last resort), teams may request mediation by the instructor. **In the extremely unlikely situation where mediation is requested and fails, the instructor may remove the offending student from the group and given this is a TEAM project, with associated learning outcomes, that student will receive a project grade of 0*.**

* note that in very rare cases of extended periods of academic accommodation, an individual may be assigned an independent, scaled down version of the team project. In such instances, it is the student's responsibility to recognize and communicate with the instructor, the ongoing nature of the problem, before the team's performance is impacted.

7.2 Grading

1. **Quizzes** - best 2 of 3. Students who MISS more than one will either have the grade weight transferred to the final exam, or, at the instructor's discretion, may be given an assignment (worth 10%) on the related course content. 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. **Assigned reading annotations** – best 6 of 7, based on completion by deadline, reading to the end, number and quality of annotations and student interactions. These are due by 9:00AM the day in which the assigned reading is being discussed.
3. **Reflections:** best 5 of 6, ~1 page, pass/fail based on evidence of good faith effort. Two types: a) the week *prior* to a quiz, summarizing areas of confusion or questions, how

those will be resolved and/or your study strategy; b) a quiz "*post mortem*" the week after a quiz, identifying where you went wrong, any concepts you still need to clarify, and how you might adjust your learning strategies.

4. **Bonus activities** - a maximum of an extra 3.5% for completion of all 7 reading annotations and an additional 1% for completion of all 6 reflections.
5. **Team project** - Project description and rubrics will be provided separately. All grades are team grades. Teams are expected to discuss and agree to early completion of individual tasks, and to discuss openly, honestly and compassionately, any potential problems with an individual's assigned task. The team effectiveness feedback summary provides teams with an opportunity to reflect upon, and discuss AS A TEAM, how they are performing, and agree upon at least one step to improve performance. At the end of the semester, each team member will provide, through the UofG PEARTool, anonymous distribution of effort evaluations. The average assessment of each team member will be used to assess individual grades based on the team mark. The individual grade may go UP or DOWN, relative to the group grade, within limits.
6. **Deadline extensions:** each student has **two free passes for a 48h extension** on a due date for an assigned reading or reflection. These are to be saved for health, or compassion-related issues that prevent you from making the assigned deadline, however no questions will be asked and no documentation will be required. It is a STUDENT RESPONSIBILITY to e-mail Dr. K. **prior to a missed deadline**, to claim a free pass; failing this, a grade of zero will be assigned. These cannot be used for team deadlines.

7.3 When You Cannot Meet a Course Requirement

- Please advise the instructor or your team members promptly by e-mail if you encounter difficulties meeting any of the course deadlines and have just cause for accommodation to be made.

7.4 E-mails

- Please only use your UofG e-mail account. When e-mailing Dr. K., please indicate the course about which you are e-mailing (I am teaching more than one), include a salutation ("Dear Dr. K." instead of: "hey"...or nothing at all) and including your preferred name at the end. Think of this as practice for e-mailing a prospective employer, reference letter provider, or potential research/grad studies advisor!
- E-mails regarding personal concerns will be prioritized
- Students are expected to monitor their UofG e-mail accounts routinely - this is the

official means of communication at UofG, and given the team aspect of this course, the instructor may e-mail reminders or enquiries. If the e-mail requires a response, please respond, just as I will respond to your e-mails.

- All questions related to course content should first be posted to the Discussion board on Courselink. Dr. K. will regularly check and respond to those posts, allowing the rest of the class to see the answers.
- If you feel you need help with your learning/study skills, please e-mail Dr. K!
- Please be patient - replies to e-mails sent outside of regular weekday hours (9 am-5 pm Eastern Time) may take 24-48h.

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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

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 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).
