

**University of Guelph**  
**College of Biological Science**  
 Department of Molecular and Cellular Biology (MCB)  
**COURSE OUTLINE**  
 Methods in Microbial Culture & Physiology, MICR\*2430  
 Fall 2016

**Course description (1.5-3) [0.50]**

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.

Prerequisite(s): MICR\*2420

**Teaching Team**

1. Dr. Wendy J. Keenleyside, Course Instructor/Coordinator. Office SSC3506 (Summerlee Science Complex), [wkeenley@uoguelph.ca](mailto:wkeenley@uoguelph.ca)
2. Deb Flett, Lab Demonstrator. Office SSC3504, [dflett@uoguelph.ca](mailto:dflett@uoguelph.ca)
3. Ashley Brott, Graduate Teaching Assistant (GTA), [abrott@uoguelph.ca](mailto:abrott@uoguelph.ca)
4. Megan Brasher (GTA), [mbrasher@uoguelph.ca](mailto:mbrasher@uoguelph.ca)
5. Carys Jones (GTA), [carys@uoguelph.ca](mailto:carys@uoguelph.ca)

**Course Schedule**

1. Seminars Tues. 1:00 - 2:20 pm, CRSC116
2. Labs Thurs. & Fri. 2:30-5:30 pm, SSC4102
  - **labs begin Sept. 15-16**

**Course Goals**

The learning outcomes for this course are listed below; these will be assessed through the various graded components of the course. They may be updated periodically, through deletion or addition, depending upon the pace and depth of coverage of a given topic. Note that categories A-D and their associated outcomes are discipline-specific. All of the learning outcomes will be taught, modelled and assessed. The material in this course will also further develop the broader MCB Program Learning Outcomes ([MCB Learning Outcomes](#), including **Problem solving & Critical thinking, Communication, Professional & Ethical behaviour**) and the University of Guelph learning outcomes ([UofG Learning Outcomes](#), including **Critical & Creative Thinking, Literacy, Communicating & Professional & Ethical Behaviour**). Note that the case study that is introduced in the lab, and on which you will work in teams, over the second half of the semester, will simultaneously cover a majority of the LOs in **A-D as well as the broader MCB & UofG LOs**.

**A. ENERGY IN BIOLOGICAL SYSTEMS; METABOLIC PATHWAYS**

*By the end of the course, successful students will:*

- A1. Demonstrate an understanding that chemical transformations of biological molecules are catalyzed by enzymes organized in metabolic pathways
- A2. Demonstrate an understanding that metabolic pathways are regulated
- A3. Demonstrate an understanding that metabolic diversity exists among eukaryotes, prokaryotes and archaea
- A4. Demonstrate an understanding of how thermodynamically unfavourable processes occur

A5. Demonstrate an understanding of the synthesis, storage and transformation of macromolecules

**B. STRUCTURE-FUNCTION RELATIONSHIPS IN BIOLOGICAL SYSTEMS**

*By the end of the course, successful students will:*

B1. Demonstrate an understanding of macromolecular interactions, structure and function

B2. Demonstrate an understanding that the properties of cells are a function of the chemical structures of their constituent macromolecules

B3. Demonstrate a deep understanding of the roles of cells as the fundamental unit of life

B4. Demonstrate an understanding of how cells, organelles and all major metabolic pathways evolved from early prokaryotic cells

B5. Demonstrate an understanding of communication within and between cells and their environment

**C. EVOLUTION AND THE FLOW OF GENETIC INFORMATION**

*By the end of the course, successful students will:*

C1. Demonstrate an understanding of the molecular structure, function and regulation of genes and genomes

C2. Demonstrate an understanding of the factors that affect the frequency of genotypes and phenotypes in a population over time

**D. SCIENTIFIC METHOD**

*By the end of the course, successful students will:*

D1. Successfully design and explain experiments for the isolation, identification and enumeration of microbes or assess such proposals

D2. Perform experiments using appropriate safety precautions, and microbiological techniques for the isolation, identification and enumeration of representative groups of bacteria and fungi

D3. Use appropriate and accurate mathematical calculations and statistical analyses and assess the reliability of data using biological and technical replicates

D4. Successfully interpret and communicate scientific data in laboratory reports, group assignments and tests

## a. Course Content: seminars

Seminar # <sup>a</sup>	Seminar Topic # and description	Readings <sup>b</sup>
S1 (Sept. 13)	1. Cellular composition and nutrition: molecular composition of bacterial cells; macronutrients, micronutrients, growth factors; growth media, oligotrophy vs copiotrophy, diazotrophy ➤ ~15 min. discussion of course outline, course format, Bloom's taxonomy	Sect. 1.4-1.5, 3.1, 4.1 & 4.3, p. 152, pp. 270—272, Sect. 15.5 Leamson (2002) – on Courselink
S2 (Sept. 20)	2. Microbial growth and enumeration: batch culture & growth curve; continuous culture; cellular enumeration methods	Sect. 4.4 & 4.5
S3 (Sept. 27)	3. The cell membrane and transport: fluid mosaic membrane; diffusion, primary and secondary transport systems	Sect. 3.2 & 4.2
S4-S5 (Oct. 4-18*) • no classes Oct. 11	4. Environmental influences on microbial growth: temperature, water activity and salt, pH, oxygen, antimicrobials ➤ S5: ~15 min. discussion on learning teams & the "Team Charter"	Sect. 5.1-5.2, 5.4-5.6, 5.8, Ch. 27 & Case study <sup>c</sup>
S6 Oct. 25	<b>2-stage midterm<sup>c</sup></b> ➤ short discussion of Case Study follows	
S7 – S9 (Nov. 1 – 15)	5. The biochemistry of catabolism: energy and entropy, energy carriers and electron transfer, energy acquisition in bacteria and archaea	Ch. 13 & 14, Case study <sup>c</sup>
S10 - S11 (Nov. 22 – 29)	6. Microbial diversity and ecology: microbes in ecosystems, biogeochemical cycling	Ch. 21 & 22 (+ parts of Ch. 18 & 19) & Case study <sup>b</sup>
<b>Dec. 1*</b> * make-up class for Fall Break day	Case Study Ch. 3 concept question team discussions, Team IF-AT quiz on concept questions	Case Study Ch. 1-3 & all associated readings

<sup>a</sup> these are approximate dates and are subject to minor alteration.

<sup>b</sup> Readings beyond the textbook are identified in the case study (in the lab manual) and provided via link or pdf on Courselink

<sup>c</sup> Individual (shortened) test followed by group test with IF-AT cards, the latter involving 10 MCQs from individual test and done in case study teams

## a. Course Content: labs

Week	Lab Topic	Readings <sup>a</sup>
1 Sept. 15-16	<b>Exp. 1</b> - Soil microbiology: - growth media, isolation and enumeration techniques, enrichment cultivation	Laboratory 1
2 Sept. 22-23	<b>Exp. 2</b> - Bacterial physiological diversity: - effect of environmental & nutrient conditions on growth, enrichment cultivation	Laboratory 2
3 Sept. 29-30	<b>Exp. 3</b> - Water quality testing: - diagnostic media and tests for identification and enumeration of coliforms, fecal coliforms & enterococci	Laboratory 3
4 Oct. 6-7	<b>Exp. 4</b> - Comparative cell counting: - viable plate counting & direct microscopic counting <b>Exp. 7</b> - Introduction to Microbial ecology & the Winogradsky columns - microscopic & macroscopic observations	Laboratory 4 Laboratory 7
5 Oct. 13-14	<b>Exp. 5</b> – Batch culture & the growth curve: - viable plate counting & optical density for <i>E. coli</i> growth curve <b>Exp. 7</b> - Introduction to Microbial ecology & the Winogradsky columns - microscopic & macroscopic observations	Laboratory 5 Laboratory 7
6 Oct. 20-21	Exp. 6 – Biochemical tests part 1: - oxidase, catalase, KOH, nitrate, O-F, extracellular enzymes <b>* Introduction to team members &amp; Case study</b>	Laboratory 6  Laboratory manual p. 111, F16 Lab Schedule & Information
7 Oct. 27-28	Exp. 6 – Biochemical tests part 2: - CHO fermentation, peptone iron agar, urease Case study: <i>Delicate Balance, Deadly Obsession</i> Lab exercise CS1 - Triclosan in aquatic environment, selection of triclosan resistance	Case Study Ch. 1 & Ch. 1 readings
8 Nov. 3-4	IF-AT quiz (Ch. 1 concept questions) Case study Ch. 2 Lab exercise CS2 - Microbial catabolic & physiological diversity; isolations from Winogradsky columns	Case Study Ch. 2 & Ch. 2 readings
9 Nov. 10-11	Case study Ch. 1 – CS1 conclusions & team discussion Case Study Ch. 2 – CS2 conclusions & team discussion	Lab manual: Case Study Ch. 2 & Ch. 2 readings
10 Nov. 17-18	Team discussion of Ch. 2 concept question draft answers & peer review comments Case Study Ch. 3 – team work/discussions	Lab manual: Case Study Ch. 3 & Ch. 3 readings
11 Nov. 24-25	→ Lab exam - individual bell-ringer + team written component	

<sup>a</sup> Case study readings are given in the case study, published in the course manual. Other readings are provided via link or pdf on Courselink

- b. Method of presentation - Students will learn the techniques and concepts through seminars & lab sessions and will use a combination of independent reading, lectures, laboratory exercises, online reading quizzes, group/team discussions (online and face-to-face), team work on an interrupted case study, REEF polling questions (a cloud-based “clicker” system) and collaborative tests/test questions. Seminar will be recorded and made available following the seminar. Seminars will be highly interactive, employing a combination of short lectures, followed by group discussions on problems, classroom polling and follow-up discussions. **Simple concepts and definitions will be itemized and covered through independent reading, laboratory exercise introductions, and reading quizzes, but will not be covered during class.**

*Team-work* - This is a major component of the course due to the documented advantages of peer discussion and instruction to facilitate deeper learning. Prior to the midterm, students will work in the lab in pairs, and will form *ad hoc* groups for group discussions in the seminar. Immediately prior to the midterm, students will be introduced to their team members, and will write the group component of the 2-stage midterm, in their teams. They will continue to work together in the lab and online/outside of class time, on the case study, the group component of the lab exam, and the 2-stage final exam. Seminars will continue to involve *ad hoc* groups for discussions/problem solving. Teams will be constructed following best practices, using student answers to a Qualtrics survey administered weeks 4-5. *While attempting wherever possible to combine 3 preexisting lab pairs, in instances of odd lab numbers, 1 or more pairs will be split.* Team member accountability will be ensured through a Team-written “Team Charter”, an initial “Team Effectiveness” group report, 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.**

### Course Resources

*Textbook* – the required textbook for this course is “Microbiology - An evolving Science”, 3rd edition by J L Slonczewski and JW Forster (WW Norton Inc, ISBN 0- 393-91929-5). This is available from the bookstore, in hard copy or as an E-book (6 months, 12 months or permanent access) or in the library on 2h reserve (<http://www.bookstore.uoguelph.ca/courselistbuilder.aspx> ).

*Laboratory manual* – this is required and may be purchased from SSC 2302), 4 days ONLY: Thurs. & Fri. Sept. 8<sup>th</sup> & 9<sup>th</sup>, and Mon. & Tues. Sept. 12<sup>th</sup> & 13<sup>th</sup>. Sale times are 9:30am-12pm and 1pm-3:30pm. The cost is \$20.00, cash only. After Sept. 13<sup>th</sup>, the price increases to \$25.00.

*Courselink* – the course website will be used extensively and will include all relevant course materials, including lecture videos, online quizzes, discussion boards, group lockers, links for additional readings, , group drop boxes and a course calendar will provide all relevant information on due dates.

*Lab schedule & Information handout* – detailed, colour-coded breakdown of weekly lab and case study activities, due dates, marking schemes, (specifically for the case study). This will also be posted.

*Team Google calendars* – once case study teams have been created, members will be encouraged to establish a shared team calendar to ensure all established and internally-agreed upon deadlines and meeting dates are readily accessible.

*Instructor’s office hours* - Group office hours – **tba**. Included in topics for discussion in these office hours (in addition to course concepts): strategies for deeper learning, more effective studying, reading for

comprehension, team skills – these will be particularly useful during the case study. **Individual meetings by appointment**

**REEF Polling** – You will be required to purchase a subscription to REEF Polling R 3.1 (by iclicker), to allow participation in class polling. This is a cloud-based platform that allows you to use your laptop or digital device to respond to MCQs, short answer or targeting questions. Last year the cost is \$9.99 USD per semester, however based on negotiated pricing at one of our neighbouring universities, I am hoping this will come down substantially. You will need to register online, using the link and instructions posted on the course website. The first 14 days are a free trial, after which you will be prompted to purchase a subscription. International students may experience problems with acceptance of their credit card; this can be resolved by purchasing a pre-loaded credit card.

**PEARTool** – UofG online platform for **Peer Evaluation, Assessment and Review**. 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.

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

**PeerWise** – this is a free online tool for authoring, answering, commenting on and rating student-authored multiple-choice questions. A site for MICR\*2420 F16 will be set up shortly 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 and criteria for high quality MCQs will be discussed in class. Dr. Keenleyside 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 midterm and final exams, 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! Participation can also be used to make up for missed REEFPolling and seminar reading quizzes, to a limit.

<https://peerwise.cs.auckland.ac.nz/docs/>

### Methods of Assessment -

Form of Assessment	Weight of Assessment	Due Date of Assessment	Course Content /Activity	Learning Outcomes Addressed
<b>Activities:</b> a) REEF polling & b) seminar reading quizzes	5.0%	a. Seminars 1-12 b. Seminars <b>2-5</b>	a. Participation in polling <sup>a</sup> b. Textbook reading on the upcoming seminar <sup>b</sup>	a) A-D b) A1-4; B1-3; B5; C1-2; D1, D4

<sup>a</sup> **REEF Polling:** each lecture will include multiple polling questions which, depending upon the difficulty level, may be polled, discussed, then re-polled, prior to revealing answers. 1 mark per question, for an estimated semester total of ~80 marks.

<sup>b</sup> **Seminar reading quizzes:** online, available Thurs-Tues, on that Tuesday’s textbook readings. **These are only scheduled for the weeks preceding the midterm.** A reading guide of relevant terms, concepts and processes will be provided in advance. 45 min. for each of 2 attempts, best mark counts. An estimated semester total of 80 marks, so roughly equal weight to REEFPolling.

Form of Assessment	Weight of Assessment	Due Date of Assessment	Course Content /Activity	Learning Outcomes Addressed
<b>Bonus activities<sup>c</sup>:</b> a) PeerWise participation & b) Qualtrics Team-creation survey submission by deadline	~0.9% bonus mark on final grade possible	a) Dec. 1 b) Oct. 13/14	a) Creation & answering of MCQs on seminar & Textbook material identified in reading guides/seminars b) submission by deadline	a) All but D2-3 b) MCB & UofG LO "Professional & ethical behaviour"
<b>Pre-lab quizzes<sup>d</sup></b>	1.5%	Weeks 1-6	Laboratory exercises 1-6	A1-5; B1-3, B5; C2; D1, D3 See "Lab Schedule & Information"
<b>Laboratory quizzes<sup>e</sup></b>	1.5%	Weeks 1-3, 5-6 lab periods	Safety; Dilutions; biochemical tests (from lab manual)	A1, A5, D3 See "Lab Schedule & Information"
<b>Laboratory reports I-VI<sup>f</sup></b>	15.0%	Weeks 3-7 lab periods	Laboratory exercises	A1-5; B1-3, B5; C2; D1, D3-4 See "Lab Schedule & Information"
<b>Laboratory skills tests</b>	1.5%	Weeks 2, 5 & 9	Streak plate & Gram stain	D2
<b>Flow charts<sup>g</sup></b>	1.5%	Weeks 1-9	Labeled diagram showing flow of that day's lab procedures	MCB & UofG LO "Professional & ethical behaviour"
<b>Midterm<sup>h</sup></b> (in class)	10% (8.5% individual + 1.5% group)	Oct. 25	Seminars 1-5 and textbook readings <sup>g</sup>	A1-4; B1-3; B5; C1-2; D1, D4
<b>Case study</b>	20%	Weeks 7-12	Case study "Delicate Balance, Deadly Obsession"	A1, 3-4; B1-3; C1-2; D1-D4 See "Lab Schedule & Information"
<b>Laboratory exam<sup>i</sup></b>	14.0%	Week 11 lab period	Techniques/ concepts from lab exercises & case study material covered to date	A1-5; B1-3, B5; C2; D1-D4
<b>Final exam<sup>h</sup></b> Location tba	30% (25.5% individual + 4.5% group)	Tues. Dec. 13 8:30-10:30am	Cumulative, including textbook readings <sup>g</sup>	All but D2-3

<sup>c</sup> **Bonus activities:** Can be used to recover lost marks from Polling/reading quizzes. This bonus grade will be added onto 5% activities grade, which will be allowed to exceed 100%. 2 marks per authored PEERWise question, 1 mark per PEERWise question answered, to a maximum of 20 marks. Additional 10 marks for submitting Qualtrics team-making survey (4-5 questions in survey) by Oct. 13/14 deadline.

<sup>d</sup> **Pre-lab quizzes:** online, available Mon-Fri, on that week's lab. 30 min. for each of 2 attempts, best mark counts.

- <sup>e</sup> **Laboratory quizzes:** written during 1<sup>st</sup> few minutes of lab period; see posted file “F16 Lab Schedule & Information” for details on specific topics and dates
- <sup>f</sup> **Laboratory reports:** due at beginning of lab; due dates identified in “Important Dates” (below), the posted “F16 Lab Schedule & Information” file and in the Courselink calendar
- <sup>g</sup> **Flow charts:** must be shown to TA at beginning of lab
- <sup>h</sup> **2-stage midterm & cumulative final exam:** consists of individual, followed by group test using IF-AT cards (<http://www.epsteineducation.com/home/>). Group grade will only be used if it is no lower than the individual grade. Individual midterms will not be handed back but multiple opportunities to view the midterms and answer keys will be provided. **Because of the nature of the 2-stage exams, students writing in SAS need to talk to Dr. Keenleyside ASAP.** 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.
- <sup>i</sup> individual bell-ringer + written (in case study teams)

### Important Dates

- these are also identified in the Courselink calendar & “Lab Schedule & Information”

	DATE	DESCRIPTION
1	Sept. 13	Seminar 1: Introduction to course, topic 1
2	Sept. 15-16	First lab period: lab exercise 1, LQ1
3	Sept. 29-30	Lab Report I due @ 2:30
4	Oct. 6-7	Lab Report II due @ 2:30
5	Oct. 11	<b>Fall break – no seminar</b>
6	Oct. 13-14	Lab Report III due @ 2:30
7	Oct. 20-21	Lab Report IV due - introduction to team members
<b>8</b>	<b>Oct. 25</b>	<b>2-stage midterm</b>
9	Oct. 27-28	Signed team charter (single hard copy) & Lab Report V due @ 2:30 in lab
10	Nov. 3-4	Case study Ch. 1 concept questions final answers due to dropbox by 9:00am of lab period; IF-AT quiz in lab
11	Nov. 4	40 <sup>th</sup> class day – drop deadline
12	Nov. 8	9:00am deadline to enrol in Case Study Ch. 2 concept question groups on Courselink
13	Nov. 10-11	9:00am deadline for Ch. 2 concept question answer submission to PEARTool; Team effectiveness feedback (to dropbox) & Lab Report VI, both by 2:30pm
14	Nov. 12	Peer reviews assigned (via PEARTool)
15	Nov. 15	Peer reviews due (2) by 9:00am (via PEARTool)
14	Nov. 17-18	Case study Ch. 2 concept questions final answers due to dropbox by 9:00am of lab period; IF-AT quiz in lab
15	Nov. 24-25	Lab exam
16	Dec. 1	Last seminar (rescheduled from fall break day) - Case study Ch. 3 concept questions draft/final answers due to dropbox by 9:00am; IF-AT quiz in class; team distribution of effort assessments due via PEARTool by 11:59pm
<b>17</b>	<b>Tues. Dec. 13 8:30-10:30am</b>	<b>Cumulative final exam</b>



## Course and University Policies

### Grading:

1. **Midterm** - students who **MISS** the midterm write a 40% (cumulative) final exam. For students who **DO** write the midterm, but perform better on the final, the midterm grade will be dropped and the grade weight transferred to the final exam.
2. **Assignments/reports** – lab reports are due by 2:30 pm on the due date; the time for submission of other assignments is identified above (usually 9:00am either on the day of the seminar or the lab period). For lab reports, deductions for late submissions will be 10% per day (the weekend counts as a 20% grade reduction), up to a 30% deduction. After 3 days, the submission will not be accepted.
3. **Quizzes** - pre-lab quizzes (PLQs) are online, available M-F and students are expected to complete all 6. Each quiz has a 30-minute time limit and two attempts are given with the best mark counting. Students who fail to write 1 or more of these must provide documentation in support of academic consideration in order to obtain an adjustment to their distribution of marks. Lab quizzes (LQs) are written at the beginning of lab periods 1-4 & 6. Students with valid grounds for being unable to complete one or more of these must talk with the lab coordinator about either writing the quiz at another time, or, provided with appropriate documentation, may have that quiz dropped from the calculation of the lab quiz grade. Reading quizzes are online, available Thurs-Tues, on that Tuesday's textbook readings. Students who fail to write 1 or more of these may make up the marks via PEERwise participation; students who miss more than 1 must provide documentation in support of academic consideration in order to obtain an adjustment to their distribution of marks.
4. **Collaborative tests** (midterm & final exams) - the individual grade will contribute 100% of that grade item if higher than the collaborative component. Students who choose to write the individual component only will similarly have that count as 100% of that grade item. *Students registered with SAS* may a) write early so that they can join the class for the collaborative portion, or b) write a 100% individual test or c) get the class average of the group test as their group component.

### E-mails:

1. Student enquiries will not be answered on nights, weekends or holidays. In addition, because of the sheer volume of e-mails your instructor receives, e-mail enquiries for which the answer is easily available by checking the lab manual, course outline or other information on the courselink site **will not be answered**.

### Student responsibilities:

1. **Respectfulness:** students are expected to treat teammates, classmates, the instructor and teaching staff with respect at all times. 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** is mandatory. If you cannot attend a laboratory session, and have valid grounds, please e-mail the lab coordinator to provide your documentation and enquire about making up the missed activities. Academic accommodations for instances where a student cannot meet a course requirement, are discussed below.
3. **Laboratory preparedness:** You must have read the relevant laboratory exercise in advance of the lab, and completed the online quiz for that week, prior to coming to the lab. A flow chart for what you will be doing in the lab is to be provided for grading at the beginning of the lab. These flow charts will 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 pairs or teams:** Lab partners are expected to work collaboratively, to communicate effectively with each other and the GTAs/lab coordinator, and to hand in independent lab reports. Following the midterm, the teams of 6-7 will negotiate and sign the terms of a team charter and will discuss and provide preliminary feedback (“Team Effectiveness Feedback”) and final anonymous distribution of effort evaluations of their team members. The team as a whole will use the individual results of the early evaluation to identify and report their agreed-upon steps for improving performance. The final evaluation is done individually and 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. 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. **Seminar preparedness:** Seminars are highly interactive. In order to arrive prepared, you must have done the assigned readings and reading quiz. Reading guides will be provided in advance of each week’s seminar, and you will be expected to learn basic definitions on your own, and have some familiarity with the concepts that will be covered. Names, terms and definitions for which you will be responsible but which will not be directly covered in class will be identified in the reading guides, and are covered in the textbook and generally in the introductions to the various laboratory exercises.
6. **REEF polling:** students are expected to resolve any connectivity issues with their device immediately and inform the instructor when such issues arise. These issues are generally the result of the wireless function of the device, however sometimes disconnecting and reconnecting your devices wifi will allow you to access the first available router, so will allow you to reconnect more quickly. If you cannot attend a seminar and have valid grounds, please e-mail the instructor to provide your documentation. Academic accommodations for instances where a student cannot meet a course requirement, are discussed below.

#### 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, and be prepared to provide supporting documentation. See the undergraduate calendar for information on regulations and procedures for Academic

Consideration: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

#### Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: <http://www.csd.uoguelph.ca/csd/>

#### Academic Misconduct

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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

#### E-mail Communication

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

**Dr. Keenleyside will not respond to e-mail enquiries when the answer is readily available in the course outline or on courselink. She also will not respond to e-mail enquiries or complaints about online quizzes while the quiz window remains open. If there is a problem, it will be addressed after the window closes.**

#### Drop Date

The last date to drop one-semester courses, without academic penalty, is the 40<sup>th</sup> class day. To confirm the actual date please see the schedule of dates in the Undergraduate Calendar. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

#### 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.

#### Recording of Materials

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

#### Campus Resources

The Academic Calendar is the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>

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

- make an appointment with a program counsellor in your degree program.  
<http://www.bsc.uoguelph.ca/index.shtml> or  
<https://www.uoguelph.ca/uaic/programcounsellors>

If you are struggling to succeed academically:

- 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/>

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.uoguelph.ca/~ksomers/>

If you have a documented disability or think you may have a disability:

- The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: <https://www.uoguelph.ca/csd/>

### Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities (soon to be re-named Student Accessibility Services) as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or refer to the [CSD website](#). The standard statements are available on the [AVPA website](#) (undergraduate courses) or from the Office of Graduate Studies (Graduate Courses).