MICR*2420 - Introduction to Microbiology

Summer 2024 Course Outline
Section: S1
Credits: 0.50

Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

Calendar Description

This course will introduce students to the diversity of microorganisms, including, bacteria, viruses, and fungi, and the impact of microbes on everyday life. The interactions of microorganisms with the biotic and abiotic worlds will be discussed. Topics will include the roles of microorganisms in host-pathogen interactions in disease, the beneficial aspects of microorganisms in bioremediation and food production, and their application in biotechnology.
Prerequisite(s): 4.00 credits including (1 of BIOL*1070, BIOL*1080, BIOL*1090, CHEM*1040)
Restriction(s): 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.
Department(s): Department of Molecular and Cellular Biology

Lecture Schedule

MonWedFri 11:30am-1:20pm in MACN*113 (5/9 to 6/28)

Labs: Starting the week of May 13th -- See CourseLink for more details.

This course will be conducted with in-person lectures and labs.

Lab / Seminar Schedule

NOTE: To add another ROW, go to the bottom right cell of table and press 'tab' button. To delete a ROW contact courseleaf@uoguelph.ca

Day	Time	Location
S102 - Tues S103 - Wed	2:30pm- 5:20pm	SSC4102

Instructor Information

Catrien Bouwman, MSc
Lab Coordinator
Email: cbouwman@uoguelph.ca
Office: SSC3504

Colin Cooper, PhD
Lecturer
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Learning Resources

Required Resources

Textbook: MICROBIOLOGY: CANADIAN EDITION (https://ecampusontario.pressbooks.pub/microbio/front-matter/preface/)
A free e-textbook developed by U of Guelph Instructor Dr. Wendy Keenleyside

Equipment: Computer with internet access
A computer with internet access and a webcam are required for the course. Testing will ideally be conducted In-person; however, this is subject to change based on University policy. A laptop or tablet will be required for Lab 5 (one per partner is also fine). Please contact the Course Coordinator (Catrien) if you have any question about this.

Laboratory Manual: Available on CourseLink

Recommended Resources

Textbook: Microbiology: An evolving science (https://wwnorton.com/books/9781324033523/)
An excellent microbiology resource

Textbook: Student Handbook for Writing in Biology. Author: Karin Knisely, Sixth Edition (earlier edition is fine). Optional but highly recommended for students continuing in the Biological Sciences.

Optional: Joan L Slonczewski (Author, Kenyon College), John W Foster (Author, University of South Alabama) Fifth Edition

Campus Resources

If you are concerned about any aspect of your academic program: Make an appointment with a Program Counsellor (https://www.uoguelph.ca/uaic/programcounsellors/) in your degree program. If you are struggling to succeed academically: There are numerous academic resources offered by the Learning Commons (https://www.lib.uoguelph.ca/using-library/spaces/learning-commons/) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills.

Library Course Reserve (Ares)

For this course, you will be required to access course reserve materials through the University of Guelph McLaughlin Library. To access these items, select **Ares** on the navbar in CourseLink. Note that you will need your Central Login ID and password in order to access items on reserve.
For further instructions on accessing reserve resources, visit How to Get Course Reserve Materials (https://lib.uoguelph.ca/find/course-reserves-ares/how-get-course-reserve-material/).
If at any point during the course you have difficulty accessing reserve materials, please contact the e-Learning Operations and Reserve Services staff at:
Tel: 519-824-4120 ext. 53621 | Email: libres2@uoguelph.ca | Location: McLaughlin Library, First Floor, University of Guelph

Course Learning Outcomes

1. Appreciate the roles of cells as the fundamental unit of life and the essential roles of the microbes in the biosphere, biotechnology, the food industry and health and disease.
2. Demonstrate an understanding of how cells, organelles and all major metabolic pathways evolved from early prokaryotic cells, the differences between the cellular microbes and the viruses and how the evolutionary history and relatedness of cellular life is depicted in the Universal tree of Life.
3. Demonstrate an understanding that the properties and metabolic diversity among eukaryotes, prokaryotes and viruses are a function of the chemical structures of their constituent macromolecules and how their evolutionary history relates to the greater metabolic diversity of the prokaryotes compared to the eukaryotes.
4. Demonstrate an understanding of the interactions of microbes with their environment, and specifically the macromolecular interactions that underlie cellular motility, biofilm formation, quorum sensing, antimicrobial therapy, immune recognition and response, and pathogenesis.
5. Demonstrate an understanding that mutations, recombination and horizontal gene transfer have selected for a huge diversity of microorganisms and the various factors that affect the frequency of genotypes and phenotypes in a population over time.
6. Scientific Method: Describe or assess the appropriate method of visualization and identification of example microbes.
7. Scientific Method: Describe experiments using appropriate safety precautions, and microbiological techniques for the isolation, identification and enumeration of representative groups of bacteria, archaea and fungi.
8. Scientific Method: Use appropriate and accurate mathematical calculations for microbial enumeration.
9. Scientific Method: Successfully interpret and communicate scientific data.

Course Goals

This course serves as the foundation of the Microbiology program. It is designed to capture your interest by introducing you to the relevance of Microbiology in everyday life, discussing the global impact of microbes, and by providing an opportunity for a remote experience with microbes in a laboratory setting. The course learning outcomes and the specific conceptual details associated with those outcomes (in bullet point) are listed below. The list may be updated periodically during the semester, through deletion or addition, depending upon the pace and depth of coverage of a given topic. Course readings, class discussions and group work will also further develop the broader MCB Program Learning Outcomes (MCB Learning Outcomes) and the University of Guelph learning outcomes (UofG Learning Outcomes).

Lecture Schedule - Subject to Change

Day:	Date:	Topic	Activities	Due:
Fri	5/10	Course Introduction		
Mon	5/13	A short history of Microbiology		
Wed	5/15	Microscopy & Modern Microbiology		
Fri	5/17	Cellular Structures and Functions of Bacteria and Archaea		
Mon	5/20	Holiday		
Wed	5/22	Microbial Ecology		
Fri	5/24	Bacterial Growth & Culture		
Mon	5/27	Biofilms, cell differentiation & environmental influences		
Wed	5/29	Metabolic Diversity		
Fri	5/31	MIDTERM EXAMINATION Covering Lectures 1-8		MIDTERM EXAMINATION
Mon	6/3	Microbial Diversity, Archaea & Eukaryotes		
Wed	6/5	Viruses - Classification and characteristics		
Fri	6/7	Immunology		
Mon	6/10	Microbes in Health & Disease (Bacterial & Viral pathogens)		
Wed	6/12	Vaccines, Antibiotics, & Antimicrobial Resistance		
Fri	6/14	Microbiota		
Mon	6/17	Microbes in the Food and Beverage Industry		
Wed	6/19	Soil Microbiology & Bioremediation		

Teaching and Learning Activities

Method of Presentation

This course is designed to capture students' attention and interest; as such teaching will be interactive wherever possible, and centered on microbiology as it pertains to everyday life, current affairs and news items.

Labs

Labs begin May 14/15, there will be 5 weeks of lab. Bring your lab coat, notebook, pen/pencil, and a permanent ink marker. Labs will focus on completing a short research project and will include techniques such as streak plating, bacterial enumeration, microscopy, Gram staining, PCR, and sequence analysis. This will be subject to change in extenuating circumstances.

Assessment Breakdown

Midterm	30%	May 31, 2024, In Class
Lab	25%	See CourseLink
Final Exam	45%	See 'Final Exam' Section below
TOTAL	100%	

Assessment Details

Midterm

30%

Date: May 31st in-class

See CourseLink for more details.

Course Learning Outcomes Assessed: 1, 2, 3, 4, 6, 7, 8, 9

Lab Activities

Lab

25%

Pre-lab Flow Charts: 4% (1% per lab beginning Lab 2)

Post Lab questions: 5% (1% per lab)

Lab Assignments: 4 lab assignments worth 15% combined (see CourseLink for due dates)

Lab Self Reflection: 1%

Course Learning Outcomes Assessed: 1, 4, 6, 7, 8, 9

Exam

Final Exam

45%

The Final Exam will be held Monday, June 24, from 11:30 AM-1:30 PM.

The final exam will cover all of the lecture content for the course.

Course Learning Outcomes Assessed: 1, 3, 4, 5, 6, 7, 8, 9

Last Day to Drop Course

The final day to drop Summer 2024 courses without academic penalty is the last day of classes: June 20

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

Course Grading Policies

Submission of Assignments

Assignments/reports - lab reports are due on the dates provided in Courselink; the time for submission of other assignments will be announced. For ALL assignments/reports, deductions for late submissions will be 10% per day (the weekend will cost a 20% grade reduction), up to a 30% deduction. After 3 days, the submission will NOT be accepted.

Assessments will be submitted electronically via Dropbox on Courselink, and will be subjected to the anti-plagiarism software Turnitin. Lab assignments must be submitted as a **Word file** (.docx) - reports not recognized by Turnitin will receive a grade of 0. It is the student's responsibility to ensure reports are submitted in the correct file format. Reports are to be written independently, without the use of AI, including ChatGPT. Requests for Lab report regrades must be submitted to the course coordinator no later than one week after receiving your grade. The coordinator will regrade the report, and the grade may go up or down.

Pre-lab Flow Charts/Post-lab questions - Flow Charts must be written prior to each lab, they will be reviewed and graded upon entry to the lab. If you are unable to attend a lab due to illness or other unforeseen circumstances you must email the Lab Coordinator *before* the beginning of the lab

(cbouwman@uoguelph.ca) and include a picture of your Flow Chart to receive the Flow Chart grade. Post-lab questions must be filled out *during* the scheduled lab time and brought to the Lab Coordinator for grading *before* leaving the lab. If you are unable to attend a lab due to illness or other unforeseen circumstances, contact your lab partner for the lab results, and show the Lab Coordinator your Post-lab question sheet at the *beginning* of the following lab to receive the Post-lab questions grade.

Please see CourseLink for more details.

Course Standard Statements

Course Policies

E-mails

1. Student inquiries will not be answered on nights, weekends or holidays. In addition, e-mail inquiries for which the answer is easily available by checking the lab manual, course outline or other information on the CourseLink site may not be answered at all.

2. Student e-mails to the instructor should be respectful, and ending with your name as it is shown in WebAdvisor (no nicknames please). Use only your @uoguelph.ca account for correspondence.

Student Responsibilities

1. Respectfulness: students are expected to treat lab partners, classmates, the instructor and teaching staff with respect at all times.

2. Unless otherwise stated, students must complete all assessments individually. For example, lab partners may work together in the lab room to accomplish hands-on experiments, but students must work individually on Flow Charts, Post-lab question sheets, and lab assignments.

Recording of Lecture Materials

By enrolling in a course, unless explicitly stated and brought forward to their instructor, it is assumed that students agree to the possibility of being recorded during lecture, seminar or other "live" course activities, whether delivery is in-class or online/remote. If a student prefers not to be distinguishable during a recording, they may:

1. turn off their camera
2. mute their microphone
3. edit their name (e.g., initials only) upon entry to each session
4. use the chat function to pose questions.

Students who express to their instructor that they, or a reference to their name or person, do not wish to be recorded may discuss possible alternatives or accommodations with their instructor.

Department of Molecular and Cellular Biology Statements

Academic Advisors

If you are concerned about any aspect of your academic program. Please make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising (https://bsc.uoguelph.ca/) or Program Counsellor (https://www.uoguelph.ca/uaic/programcounsellors/)

Academic Support

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: Chemistry / Physics Help (http://www.lib.uoguelph.ca/getassistance/studying/chemistry-physics-help/) and Math / Statistics Help (http://www.lib.uoguelph.ca/getassistance/studying/math-stats-help/)

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 (https://www.uoguelph.ca/webadvisor/) as they become available.

Online Behaviour

Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own

- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or Tas
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your username and password
- Recording lectures without the permission of the instructor

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 (http://www.e-laws.gov.on.ca/index.html.html) (FIPPA). 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 (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml/) please see the Undergraduate Calendar.

Wellness

If you are struggling with personal or health issues:

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

Standard Statements for Undergraduate Courses

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 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 (https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/) is outlined in the Undergraduate Calendar.

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 10 days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and

exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (https://www.uoguelph.ca/sas/)

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodations of Religious Obligations (https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-accommodation-religious-obligations/).

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.

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 undergraduate students 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 the Undergraduate Calendar - Dropping Courses (https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/).

Email 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.

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (https://wellness.uoguelph.ca/). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (https://wellness.uoguelph.ca/navigators/) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources (https://wellness.uoguelph.ca/shine-this-year/). The Student Wellness team are here to help and welcome the opportunity to connect with you.

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).

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.

Resources

The Academic Calendars (http://www.uoguelph.ca/registrar/calendars/?index) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

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. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/)