

ENVS*2080 - Introduction to Environmental Microbiology

Winter 2025 Course Outline

Section: 01

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 environmental microbiology, with a focus on the important roles of microorganisms in various environments such as soil, water and sediments. Discussion will emphasize the physiology, biochemistry, molecular biology and ecology of microorganisms, and how a good understanding of these microbial processes can enable beneficial applications of microorganisms in biotechnology and bioremediation.

Prerequisite(s): BIOL*1070, BIOL*1090

Restriction(s): ENVM*1020, ENVS*2320

Department(s): School of Environmental Sciences

Course Description

This course will introduce students to Environmental Microbiology, focusing on the interaction between microorganisms in the environment. We will investigate the physiology, biochemistry and ecology of microorganisms using theory and labs and relate these to the of microorganisms in the environment and applications of microorganisms in biotechnology and bioremediation.

Lecture Schedule

MonWed 10am-11:20am in RICH*2529 (1/6 to 4/21)

Lab / Seminar Schedule

Day	Time	Location	Sections
M	2:30 - 5:20 pm	GHRM 3308	101
T	2:30 - 5:20 pm	GHRM 3308	102
W	2:30 - 5:20 pm	GHRM 3308	103
F	11:30 am - 2:30 pm	GHRM 3308	104

Instructor Information

Jacqueline Goordial

Email: goordial@uoguelph.ca

Additional Support and Resources

Students may email Goordial@uoguelph.ca to schedule time to talk with instructor about lecture and lab materials. Goordial is always available for 15 minutes after lecture for student questions.

Teaching assistants are also available for lab and lecture questions. Teaching assistants for the course:

Section 101 (M2:30pm) - Lexi Mollica lmollica@uoguelph.ca

Section 102 (T2:30pm) - Hanlan McDougall hmcDougall@uoguelph.ca

Section 103 (W2:30 pm) - Sarah Kingsley skingsle@uoguelph.ca

Section 104 (F11:30 am - Jenna Scharnowski jscharno@uoguelph.ca

Learning Resources

Required Resources

There is no required textbook for this course. Required reading will be required throughout the course to 1) prepare for laboratories and 2) supplement lecture material. These will be posted on the course website on [courselink](https://courselink.uoguelph.ca/) throughout the course: Course link (Website) (<https://courselink.uoguelph.ca/>). Students will be required to take and pass a course on biosafety before participating in labs. Students can register for the (free) course here: <https://ehs.opened.uoguelph.ca/index.cfm?> (<https://ehs.opened.uoguelph.ca/>). Enroll in the "EHS Biosafety (Investigative staff/lab worker) - 2024 (https://ehs.opened.uoguelph.ca/?act=view&event_id=2843)" course. Bring a copy of your completion certificate to the first lab.

Course Resources

Students are required to bring a hardcover lab notebook to laboratories (a dollar store composition notebook is great for this). Students are required to have a lab coat in all labs to be permitted to enter (goggles are not required. A scientific calculator is required for exams.

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.

Cost of Textbooks and Learning Resources

Textbook / Learning Resource	Required / Recommended	Cost
No textbook is required		\$0
lab notebook	required	~2\$
lab coat	required	\$29.99 (at U.Guelph bokpstore)
Plastic bottles / glass bottle for laboratory 1	required	suggest use something from recycling ~\$0

Students are advised that prices are often determined by the publisher or bookstore and may be subject to change.

Course Learning Outcomes

1. Gain an awareness of the importance, and ubiquitous nature of microorganisms in the environment.
2. Comprehend the general properties of microorganisms that limit their growth, survival, and proliferation in the environment.
3. Learn the basic interactions between (a) microorganisms and their environments, and (b) microorganisms and chemicals in the environment.
4. Grasp the general strategies and considerations for isolating microorganisms from the environment.
5. Learn principles of aseptic techniques and safety while doing laboratory research involving microorganisms.
6. Describe several microbial adaptations to adverse conditions.
7. Describe examples of the application of microorganisms towards environmental issues (for ex. bioremediation)
8. Describe how to use genomic tools to identify microorganisms and their potential roles in the environment

Labs

Labs will occur the following weeks, with lab reports for each lab due before the next lab (with the exception of lab 1 which is due April 4th 2025). Some lab experimentation results require an 'incubation' period. You will have to come into the lab to observe your experiments if applicable, or for in some

cases these results will be made available via courselink the week after the lab. In person attendance to laboratories is required for course assessment. Students are required to complete and maintain a lab notebook. Students who do not have appropriate PPE (eg. lab coat, closed toes shoes) will not be permitted in the lab

Schedule of Laboratories and Laboratory Assignments

Week of	Topic	Activities	Due
1/6	NO IN PERSON LABS.	Ensure you take the requisite online EHS biosafety course this week (linked above)	before January 13th, 2025
1/13	Lab # 1 Introduction to Winogradsky Column experiment and home set-up		Report due April 4th (12%)
1/20	Lab #2 Microbial microscopy and gram staining		Lab report due week of February 3rd (on day of your lab section) (8%)
1/27	no lab		
2/3	Lab #3 Isolation, enumeration and disinfection of microorganisms		Lab 2 report due this week Lab report 3 due week of Feb 24th (on day of your lab) (8%)
2/10	Observations of results from lab #3		
2/17		Winter Break	
2/19		Winter Break	
2/24	week of midterm exam - no lab		lab report # 3 due this week!
3/3	Lab #4: DNA extraction, DNA quantification and DNA sequencing		Lab report #4 due week of March 24 (on day of your lab) (12%)
3/10	DNA sequencing of Lab #4 available on courselink		
3/17	DNA quantification (if not finished 03/03/25. Bioinformatic analysis of DNA sequences tutorial		Lab notebooks handed in for grading this week, returned week of March 24th
3/24	Winograsky column results and discussion (bring columns to lab in person)		Lab report #4 due this week!
3/31	No lab, good luck on exams!		Lab report #1 due April 4th.
4/7	FINAL EXAM		

Assessment Breakdown

Description	Weighting (%)	Due Date
Midterm	25%	February 26, 2025
Lab report #1	12%	April 4, 2025
Lab report #2	8%	Week Feb 3, 2025
Lab report #3	8%	Week Feb 24, 2025
Lab report #4	12%	Week of March 24, 2025
Final Exam	30%	April 7, 2025
Lab notebook	5%	Week of March 17th, returned to students March 24th

Assessment Details

Final Exam

Date: Apr 7

Time: Mon 8:30am-10:30am

Location: TBA *Please see Web Advisor closer to the date of scheduled final for location.*

To understand rules and regulations regarding Examinations students are encouraged to read Student's Responsibilities (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/examinations/>)

If the student is unable to meet the final exam requirements due to medical, psychological or compassionate circumstances they are encouraged to review Student's Responsibilities in the Academic Consideration, Appeals and Petitions (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>) section of the Academic Calendar.

Grading Schemes

Grading Policy

Dr. Goordial will grade all your midterms and final exams. The TAs will grade all your lab reports and lab notebooks.

In this course, your instructor and TAs will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph. All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin service is subject to the Usage Policy posted on the Turnitin site (<https://www.turnitin.com/>).

Last Day to Drop Course

The final day to drop Winter 2025 courses without academic penalty is the last day of classes: April 04

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

Students will submit individual lab reports for grading, however, will work on collaborative data for some labs.

Students will hand in their lab reports using the dropbox function of courselink. Students will be graded in lab by their TA's for the completeness of their lab notebooks.

Late Assignment

10% of the lab report marks are deducted on a daily basis after the due date.

Open Text Field #2

<Optional Instructor Input>: If desired, instructors may add any additional content they so choose to. The title of this content block is editable.

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/navigation/>) 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/>)