MGY377H1 F

Microbiology I: Bacteria

Fall 2024 Syllabus

## Course Meetings

### MGY377H1 F

| **Section** | **Day & Time** | **Delivery Mode & Location** |
| --- | --- | --- |
| **LEC0101** | Monday, 2:00 PM - 3:00 PM Wednesday, 2:00 PM - 3:00 PM Friday, 2:00 PM - 3:00 PM | In Person: ES 1050 In Person: ES 1050 In Person: ES 1050 |

Refer to ACORN for the most up-to-date information about the location of the course meetings.

## Course Contacts

**Course Website:** <https://q.utoronto.ca/courses/356015>

**Instructor:** Alan Davidson

**Email:** [alan.davidson@utoronto.ca](mailto:alan.davidson@utoronto.ca)

**Additional Notes:** Please contact your TA for all questions.

**Instructor:** William Navarre

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**Additional Notes:** Please contact your TA for all questions.

**Teaching Assistant:** Krystina Sztanko

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**Office Hours and Location:** By appointment only.  Use message board on Quercus.

**Teaching Assistant:** Beatrice Fung

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**Office Hours and Location:** By appointment only.  Use message board on Quercus.

**Teaching Assistant:** Jacqueline Watt

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**Office Hours and Location:** By appointment only.  Use message board on Quercus.

## Course Overview

An in depth study of bacteria including their structure, their biology, their ability to adapt, and their effects on human health. Provides a foundation for advanced studies in bacterial physiology, bacterial genetics, molecular pathogenesis of disease, immunology, and environmental studies.

### Course Learning Outcomes

MGY377H1 is designed to give students with no prior experience in microbiology a fundamental understanding of central concepts in the field with a focus on bacteria.  Microbes represent both a potent medical threat as well as our best avenue to solving many of the most pressing challenges including sustainable energy production, bioremediation and production of recombinant pharmaceuticals.  A solid understanding of fundamental microbiology is an excellent foundation for future studies in biomedical research, medicine, dentistry, public health, as well as biomedical, environmental, and industrial engineering.

**Concepts we will cover include:**

**Bacterial physiology and structure.**  Bacteria are simple cells but they have very intricate subcellular architecture.  They can also be capable of metabolic tricks that “higher” organisms cannot perform including the ability to utilize a large number of compounds as energy sources.  Students will gain a solid basic understanding of bacterial architecture and metabolism.

**Bacterial genetics, genomics and evolution.** The first genomes sequenced were from microbes and the study of microbial genomics continues drive fundamental concepts in bioinformatics and genome analysis.  Students will gain a basic understanding of how microbial genomes are sequenced, analyzed, and how our knowledge of bacterial genomes has revolutionized our understanding of everything from the impact microbes have on the environment to how they cause disease.

**How bacteria cause disease.** The vast majority of bacterial species are harmless.  However, the causes of tuberculosis, dysentery, cholera, diphtheria and plague are bacterial.  We will explore exactly how these bacteria cause disease and what makes pathogens different from most other bacteria.

**The emergence of antibiotic resistance.**  The gains medical science has made in controlling infectious disease over the past few decades are rapidly being reversed by the emergence of strains that are resistant to most or all antibiotics.  We will cover what an antibiotic is, how they work, and the details of how bacteria evolve resistance.

**The role of bacteria in the environment.**  Microbes have enormous consequences on the environment including the global cycling of almost all the building blocks of life (carbon, nitrogen, oxygen, phosphorus, sulphur, and iron).  We will cover some of the most interesting and important examples of how the ability of bacteria to employ complex metabolic pathways contributes to the biosphere as a whole.

**Microbiological techniques.**  The study of microbes, including E. coli and its phages, is the founding basis for all of molecular biology.  Throughout the course we will introduce the techniques scientists have developed to study microbes.

**Prerequisites**: BCH210H1/BCH242Y1, BIO120H1, BIO230H1/BIO255H1

**Corequisites**: None

**Exclusions:** BIO370Y5

**Recommended Preparation**: None

**Credit Value:** 0.5

Our pre-requisite policy is fairly loose.  You take this course without the listed pre-requisites at your own risk.  Students should have a basic understanding of the fundamentals of biochemistry.  If a student is unclear on what a protein is, what an amino acid is, what is the difference between a sugar and a lipid, etc., then they will likely struggle in this course.  There is a fair amount of prior knowledge assumed about the following topics:

- Transcription (DNA read into RNA)

- Translation (RNA read into protein)

- Basics of cell structure (lipid membranes)

- Fundamental biochemical building blocks (amino acids, nucleotides, lipids, sugars)

- Fundamentals of enzymes (a general sense of what they do, how they work, and how they can be inhibited).

## Marking Scheme

| **Assessment** | **Percent** | **Details** | **Due Date** |
| --- | --- | --- | --- |
| **First Midterm** | 30% | Multiple choice test of approximately 30 questions covering lectures 1 through 10. | 2024-09-27 |
| **Second Midterm** | 30% | Multiple choice test of approximately 30 questions covering lectures 11 through 20. | 2024-10-25 |
| **In-Person Final Exam** | 40% |  | Final Exam Period |

### Late Assessment Submissions Policy

There is no penalty for taking a makeup test if the appropriate notifications and documentation were provided by the student. More details are provided below.

## Policies & Statements

### Religious Accommodations

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

### Students with Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <https://studentlife.utoronto.ca/department/accessibility-services/>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

### Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the [Code of Behaviour on Academic Matters (https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019)](https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources. For example, to learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at [http://www.writing.utoronto.ca](http://www.writing.utoronto.ca/). Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see [A&S Student Academic Integrity (https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity)](https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) and the [University of Toronto Website on Academic Integrity (https://www.academicintegrity.utoronto.ca)](https://www.academicintegrity.utoronto.ca/).

### Specific Medical Circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. Normally, I will ask you for documentation in support of your specific medical circumstances. This documentation can be an Absence Declaration (via ACORN) or the University's Verification of Student Illness or Injury (VOI) form. The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. If you cannot submit a VOI due to limits on terms of use, you can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI (including dates, academic impact, practitioner's signature, phone and registration number). For more information on the VOI, please see [http://www.illnessverification.utoronto.ca](http://www.illnessverification.utoronto.ca/). For information on Absence Declaration Tool for A&S students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

### Accommodation for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or other forms of academic consideration. They may be able to email your instructors directly to provide a College Registrar's letter of support and connect you with other helpful resources on campus.

### Make-Up Quizzes/Tests

This item is listed here to remind you that you may wish to include your policy on make-up quizzes and term tests in your syllabus. There is some latitude in designing a policy that will work in the context of your course, but any policy works best if it is stated clearly from the outset and applied fairly and consistently. See Section 5.3 in the [A&S Academic Handbook (https://www.artsci.utoronto.ca/faculty-staff/teaching/academic-handbook#TermTests)](https://www.artsci.utoronto.ca/faculty-staff/teaching/academic-handbook" \l "TermTests).

### Harassment/Discrimination

Some instructors choose to include syllabus statements directly addressing policies regarding harassment and discrimination, including sexual harassment. We have not provided sample text here, as this is best crafted by each instructor, in conversation with colleagues. Helpful documents to consider when thinking through this question include the ["Conflict of Interest and Close Personal Relations"](https://www.provost.utoronto.ca/planning-policy/conflict-of-interest-close-personal-relations/) guideline and the policies and guidelines on Workplace Conduct collected at the [Human Resources and Equity website](https://people.utoronto.ca/policies/" \l "Conduct).

### Mental Health and Well-Being

Your mental health is important. Throughout university life, there are many experiences that can impact your mental health and well-being. As a University of Toronto student, you can access free mental health and wellbeing services at Health & Wellness (<https://studentlife.utoronto.ca/department/health-wellness/>) such as same day counselling, brief counselling, medical care, skill-building workshops, and drop-in peer support. You can also meet with a Wellness Navigation Advisor who can connect you with other campus and community services and support. Call the mental health clinic at 416-978-8030 ext. 5 to book an appointment or visit [**https://uoft.me/mentalhealthcare**](https://uoft.me/mentalhealthcare) to learn about the services available to you.

You can also visit your College Registrar to learn about the resources and supports available: <https://www.artsci.utoronto.ca/current/academic-advising-and-support/college-registrars-offices>

If you’re in distress, you can access immediate support: <https://uoft.me/feelingdistressed>

### Video Recording and Sharing (Download Permissible; Re-use Prohibited)

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.  
  
Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.  
  
For questions about the recording and use of videos in which you appear, please contact your instructor.

### Course Materials, including lecture notes

Course materials are provided for the exclusive use of enrolled students. These materials should not be reposted, shared, put in the public domain, or otherwise distributed without the explicit permission of the instructor. These materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Students violating these policies will be subject to disciplinary actions under the Code of Student Conduct.

**Students should also be aware that the lecture materials are the intellectual property of the lecturers.**  Access to this material and to the lectures (and lecturers), who have unique, special, up-to-date expertise in the course topics, is something you have earned through your previous efforts that got you into this course, and is also a significant component of what you are paying for with your tuition.

Distribution of the lecture materials (e.g. on other web sites, in computer or paper files accessible by other students or the public, or by giving paper copies to others not registered in the course) without permission constitutes an academic offence, and the instructors have the right to pursue disciplinary action.

The same principles apply to recordings of the lectures.  The individual lecturers can decide whether to allow recordings, and distribution of such recordings without permission constitutes an academic offence.

Worried?  Don't be. We don't care if you share a recording or slides or notes with somebody you know who is in the class.  Just don't post it on Facebook or some other site for downloading by random people and we'll be cool.  **Honestly - w**e're really just trying to fight off those websites and services that sell course materials.  Don't give our stuff to them and don't post the lectures to YouTube or a similar open site and we're good.

### Late/Missed Assignments

The graded assignments for this course comprise two midterms and a final exam.  The dates are posted well in advance.  If you have a **forseeable conflict** with these dates (family wedding, etc.) please let your TA know as soon as possible so we can make arrangements for an alternate seating.

If you cannot attend one of the two midterms due to sudden illness or an unexpected emergency, **you are required to contact us within 24 hours of the missed test (by 2 pm the following day).**  If you fail to contact us within 24 hours your mark will be zero.  Do not contact the TAs (or professors) before the test because we are quite busy preparing.  Let us know the day of the test or the day after.

We will follow the established university policies regarding medical notes.  We do not guarantee that we will excuse poorly-explained or undocumented absences from midterms.

Because the tests and final are not cumulative, we do not reweight final course marks.  **Example:** if you miss midterm #1 we will not adjust the scheme by simply making midterm #2 and the final exam count for more.

**Conflicts and absences from the final exam are dealt with through your registrar.  The instructors are not involved in the administration of the final exams and do not have any input on whether you will be able to take a makeup final exam.**

### Recording Lectures (by Student)

We will make an attempt to record all lectures using the OCCS app.  However sometimes there are technical issues and we will not guarantee that every recording will be of excellent quality (it's usually the audio that fails if the microphone loses power).  Students may record lectures using their own devices as long as those recordings are not shared widely online or with people not enrolled in the course.  Please see our policy on course materials for more information.

### Quercus Info (if using)

This Course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. New information and resources will be posted regularly as we move through the term. To access the course website, go to the U of T Quercus log-in page at [https://q.utoronto.ca](https://q.utoronto.ca/). SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.