

Course Outline – MIMM 390 SEA-PHAGES: Phage Discovery

General Information

Course #	MIMM 390
Term	Fall
Year	2022
Course pre-requisite(s)	MIMM 211, MIMM 212, BIO 200
Course co-requisite(s)	MIMM 323, MIMM 384, MIM 324
Class times	Students must attend lectures and lab sessions (Tuesdays & Thursdays)
Start/End dates	Tuesday September 6 th , 2022 / Thursday December 1 st , 2022
Lecture	Tuesdays , from 1:00pm – 2:00pm (Room 507-509, Duff)
Laboratory sessions	Tuesdays , immediately following the lecture – 5:00pm and Thursdays , from 1:00pm – 5:00pm (Room D6, Duff)
Number of credits	3

Instructor Information

Name and Title	Dr. Corinne Maurice
E-mail	corinne.maurice@mcgill.ca

TA: Michael Shamash	
Office hours (incl. virtual)	Mondays at 2pm and by appointment
Communication plan	Available via email (expect a 2-day response time); meetings and office hours can be held via Zoom

Course Description

As viruses play a major role in the world, including bacteriophages, as they are one of the most abundant viruses on this earth. As such, bacteriophages have a large influence on research and bacterial evolution and there is a need to further their discovery and identification. As part of the SEA-PHAGES (Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science) research team, this course covers microbiology and molecular biology content about bacteriophages, followed by hands-on experience through isolation and characterization of novel bacteriophages from soil samples using various microbiology and virology techniques.

Learning Outcomes

By the end of the course, students should be able to:

- Understand the importance of phage discovery
- Describe and discuss key molecular and virology laboratory techniques
- Demonstrate the ability to follow an experimental protocol appropriately and safely
- Analyze and interpret scientific data
- Keep a detailed and properly formatted notebook throughout the semester
- Provide peers with constructive feedback during oral presentations
- Communicate scientific findings in a written and oral format
- Read and discuss scientific research articles
- Work effectively in a team

Instructional Method

This course will be held in person on the days and times mentioned above. There will be weekly lectures of approximately **60 mins**, which will include Polling and Q & A. Lectures will include discussions, and will be followed interactive work including group work in the laboratory, presentations, and individual assignments. This class contains one main project and several minor assignments that the students are expected to complete. All assessments will be uploaded on **myCourses**.

Technologies that this class will require are the polling @McGill and online resources such as the SEA-PHAGES platform, PhagesDB, Google Drive.

Tutorial video links to various virology techniques will also be uploaded on myCourses to support the students' learning.

Polling @McGill:

- Polling will be used in this course to enhance engagement and increase interactivity with the students
- During a class with polling questions, students will respond to questions from the instructor from a personal device (smartphone, tablet, or laptop).
- Polling will be available through www.mcgill.ca/polling.
- To participate in Polling sessions, you **MUST** first register for an account by clicking on **Register Your Account** at www.mcgill.ca/polling and logging in with your McGill username and password. Follow the prompts to agree to the terms of use and create your account. For more information, please visit the **Getting Started for Students** section at www.mcgill.ca/polling.
- For any technical problems with polling, please contact the IT Service Desk: <http://www.mcgill.ca/it/get-started-it/need-help>.
- To maintain a safe and respectful classroom environment, please ensure that any polling responses submitted are appropriate and relevant to the question asked. Please note that unless the poll is labelled as anonymous, your responses are identifiable to the instructor. Please see the Code of Student Conduct and Disciplinary Procedures.

Expectations for Student Participation

Student participation is a key aspect of this course. Students are expected to engage in class discussions and their participation will be assessed. This class relies on student engagement and their ideas. As a research project course, students are expected to think critically and interact with their fellow classmates to answer questions and complete assignments.

Required Course Materials

Students are expected to read the specific sections from the online [Phage Discovery Guide](#) and to upload some of their assignments on Google Drive. The assigned readings will be uploaded on myCourses.

Course Content

In this course, students will learn about bacteriophage biology, the SEA-PHAGES program and virology, microbiology, and molecular biology techniques. The course will consist of lectures about basic bacteriophage biology, introduction to all the laboratory techniques used in the course, how to keep lab notebooks, journal clubs, and discussions about future experiments and interpreting data. An overview of the modules that we will cover throughout the semester are found below.

Class/Module	Date
1. Importance of phage discovery, lab, and phage basics	September-October 2022
2. Bacteriophage isolation	September-November 2022
3. Novel bacteriophage purification and amplification	November-December 2022
4. Further characterization of novel bacteriophages	Winter 2023 (MIMM 390, Genome Annotation)

Evaluation

Students will submit a final graded report at the end of the semester. Students will be asked to write a draft report prior to the final report. Students will be assessed on their participation in class discussions, an oral presentation, a journal club, their lab notebooks, their lab performance, and mini assignments that will strengthen their understanding of bacteriophage discovery. This course is designed to ensure students learn from each other. The assignments (outline, expectations, and rubrics) will be clearly described on myCourses and during class sessions to ensure students understand what is expected of them. Students will be supported throughout the semester for each assessment by allowing them to ask questions during class and providing class time to work on specific assignments.

There will be a 5% penalty per day for late assignment submissions. If for any reason, the student cannot submit an assignment on time, they must email Dr. Maurice prior to the deadline of the assignment. Assignments should be submitted via myCourses, unless specified otherwise.

The evaluation criteria as well as the due dates of each assessment are listed below:

Name of Assignment	Due Date	% of final grade
Global Phages assignment	Beginning of semester	5
Lab notebook assessment (2x)	Once in the beginning of semester Mid to end of semester	10
Project oral presentation	End of semester	10
Peer-review feedback of oral presentation	End of semester	5
Journal Club assignment	Mid-Semester	10
Report outline	Mid to late semester	5
Lab performance assessment	Mid to late semester	10
Participation in class discussions and in teams	Throughout semester	5
Draft report + Interactive coversheet	Mid to late semester	15
Final report	Late semester	25

McGill Policy Statements

Language of Submission

“In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.”

« Conformément à la Charte des droits de l’étudiant de l’Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l’un des objets est la maîtrise d’une langue). »

Academic Integrity

“McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures” (see McGill’s guide to academic honesty for more information).

« L’université McGill attache une haute importance à l’honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l’on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l’étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le guide pour l’honnêteté académique de McGill). »

Inclusive Learning Environment

This course is designed to help you learn to communicate professionally both during your time at McGill and in your future workplaces. In keeping with McGill’s policies on student rights and responsibilities, it is expected that during class discussions and small group interactions you will communicate constructively and respectfully. Sexist, racist, homophobic, ageist, and ableist expressions will not be tolerated in the classroom or during group meetings held outside of class.

McGill is committed to providing an inclusive and supportive learning environment. If you experience barriers to learning in this course, do not hesitate to discuss them with your instructor. If you have a special learning need or disability, you are encouraged to contact the Office for Students with Disabilities: <https://www.mcgill.ca/osd/>.

Health and Wellness

Student wellbeing is a priority for the University. To help students find the support they need as quickly as possible, all of McGill’s health and wellness resources have been integrated into a single [Student Wellness Hub](#), a one-stop shop for everything related to physical and mental health. If you need access to services or would like more information, you are strongly encouraged to visit the Virtual Hub: <https://www.mcgill.ca/wellness-hub/>.

McGill Writing Centre Tutorial Service

Writing well is key to both academic and professional success. The McGill Writing Centre (MWC) offers credit courses in academic and professional writing, and a tutorial service open to all McGill students: <https://www.mcgill.ca/mwc/tutorial-service>. The tutorial service offers one-to-one

sessions with seasoned instructors and experienced tutors who will work with you at any stage of the writing process.

During the campus closure period, there will be no tutors on site and no administrative staff at the MWC to answer inquiries. Tutoring sessions will be conducted online via the Microsoft Teams platform. This application is available for free to all students through Office 365: <https://www.mcgill.ca/it/office365-software>. For information about how to book an appointment through Microsoft Teams, please go to <https://www.mcgill.ca/mwc/tutorial-service>.

McGill Library

Discover the McGill Library's rich array of resources. Watch a short welcome video in English, French, Arabic, Chinese, Hindi, Persian, Spanish, or Urdu: <https://www.mcgill.ca/library/orientation>.

Additional Statements

- “The University Student Assessment Policy exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads. All students and instructors are encouraged to review this Policy, which addresses multiple aspects and methods of student assessment, e.g. the timing of evaluation due dates and weighting of final examinations.”
- “© Instructor-generated course materials (e.g., handouts, notes, summaries, exam questions) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.”
- “As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.”
- “McGill University is on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. We acknowledge and thank the diverse Indigenous people whose footsteps have marked this territory on which peoples of the world now gather.”

« L'Université McGill est sur un emplacement qui a longtemps servi de lieu de rencontre et d'échange entre les peuples autochtones, y compris les nations Haudenosaunee et Anishinabeg. Nous reconnaissons et remercions les divers peuples autochtones dont les pas ont marqué ce territoire sur lequel les peuples du monde entier se réunissent maintenant. »
- “End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.”

- “In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.”
- Additional policies governing academic issues which affect students can be found in the McGill Charter of Students’ Rights (see document).
- McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill. (See the Office of Sustainability.)