Advanced Topics in Molecular  
and Medical Virology Syllabus

Department of Microbiology and Immunology  
MICI4114 Winter 2025

*Dalhousie University acknowledges that we are in Mi’kma’ki, the ancestral and unceded territory of the Mi’kmaq People and pays respect to the Indigenous knowledges held by the Mi’kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.*

*Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.*

**Course Instructor(s)**

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| --- | --- | --- |
| Name | Email | Office |
| Denys Khaperskyy (course coordinator) | d.khaperskyy@dal.ca | Tupper 1A |
| Craig McCormick | craig.mccormick@dal.ca |  |
| Brett Duguay | bduguay@dal.ca |  |
| Christopher Richardson | chris.richardson@dal.ca |  |

**Course Description**

This advanced course focuses on selected aspects of virology and consists of lectures and student presentations based on current research papers. Topics may include: viruses and innate immunity, virus interactions with host cells, zoonotic viruses, vaccines and antiviral drugs. Exact topics change from year to year. Students who are considering future graduate studies and/or intend to do Honours research in virology or closely related themes (e.g. host-pathogen interactions, innate immunity) will benefit the most from taking this course.

*Course Prerequisites*

Students can enroll in the Fall semester but must attend the first class where final admittance is determined. Restricted enrollment based on performance in MICI 3114 (minimum A- or instructor's permission).

*Course Exclusions*

This course is restricted to students registered in a Majors or Honours degree in Microbiology and Immunology; any other students interested should consult the course coordinator.

**Student Resources**

Instructors are available for 30-min meetings with each student prior to their first oral presentation (scheduled by request, usually after the previous class but not on the same day as the scheduled student presentation). If needed, additional meetings with the course coordinator or section instructors can be requested and scheduled individually.

**Course Structure**

*Course Delivery*

In-person, lectures and student presentations are not recorded.

The first few lectures describing course themes, structure, and assignments will be delivered by the course coordinator and PDF documents with lecture slides uploaded to the course Brightspace page. Each of the four course sections is focused on a specific virology theme and starts with an introductory lecture by the section instructor. Remaining classes in each section feature student oral presentations and class discussion of primary research papers assigned in advance. Attendance at all classes (lectures and student presentations) is mandatory.

*Lectures*

**Mon/Wed/Fri 11:35- 12:25 in Dentistry 2537**

**Course Materials**

All required course materials will be available on Brightspace page in the “Content” section. There is no textbook for the course. PDF versions of assigned primary papers and relevant review articles will be uploaded ahead of each section.

**Assessment**

Assessment Weight (%)  
In class oral presentations (2 by each student) 50% (25% each)  
10 x 2-page paper summaries (2-3 per section; due at the start of each class) 40%  
In class discussion/participation 10%

*There are no additional assignments, tests, quizzes, and there is no final exam.*

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| Conversion of numerical grades to final letter grades follows the  [Dalhousie Grade Scale](https://www.dal.ca/campus_life/academic-support/grades-and-student-records/grade-scale-and-definitions.html) | | | |
| A+ (90-100) | B+ (77-79) | C+ (65-69) | D (50-54) |
| A (85-89) | B (73-76) | C (60-64) | F (0-49) |
| A- (80-84) | B- (70-72) | C- (55-59) |  |
|  |  |  |  |

**Course Policies on Missed or Late Academic Requirements**

Students are expected to attend each class in person and submit their written assignments (2-page paper summaries) before the class starts. In each section we discuss 5-7 papers, and each student must submit a summary for only 2 or 3 per section (total of 10). Therefore, there will be no accommodation for missed assignments other than for extended absence due to illness or other adverse circumstances. Any specific accommodation would be considered on a case-by-case basis. The Student Declaration of Absence (SDA) is not required.

**Course Policies related to Academic Integrity**

Each student is expected to work on their assignments individually. In case plagiarism is detected in a written paper summary, that summary will be graded zero.

Use of any generative AI and large language models (e.g. ChatGPT) is not permitted, including proofreading or language “polishing”.

**Learning Objectives**

Upon successful completion of the course, students should be able to:

* Recognize different virology research areas discussed in each section of the course.
* Locate relevant information about research questions, methodology, and experimental results in a primary research article in virology.
* Describe experimental methods commonly used in virology research.
* Summarize information contained in a primary research article in a written format.
* Describe the content of a research paper by composing presentation slides and delivering an oral presentation to the class.
* Demonstrate knowledge of the selected virology research theme by answering questions about presented research from the audience.
* Identify key experimental results in a research paper that are necessary to draw the main conclusion of the study.
* Recognize limitations of commonly used experimental models and methods in virology research
* Evaluate research publications critically and provide specific feedback on their strengths and weaknesses.
* Integrate information received from introductory lectures, recommended review articles, and assigned primary research papers.

**Course Content**

The overall aims for this course are to provide students with a detailed appreciation of several aspects of modern virological research, and to offer students an opportunity to improve their scientific communication skills. These objectives are achieved by in-depth examination of recent journal articles that reflect avenues of research currently being explored in selected broad areas of virology. There are four sections in the course that cover different topics. At the start of each section, the faculty coordinator responsible for that section gives a general overview of the topic (1-2 lectures). Subsequent sessions involve the oral presentation by students of individual research articles assigned by the faculty.

There is one PowerPoint presentation per class which should be carefully planned and rehearsed to last ~35 min (guidelines for presentations are provided in course materials). Presenters should provide a general overview of the paper and relevant background information before presenting the specific results. Presenting students are encouraged to consult with the faculty coordinators of each section to ensure that they have a clear understanding of the material to be presented. Faculty can also advise students on the format of their presentations. The objective is to ensure that the class fully appreciates the nature, limitations, and significance of the research.

Presenters will be evaluated on their comprehension of the paper and on their communication skills (a copy of the evaluation criteria is provided in course materials) and will be given oral and written feedback on their presentation immediately after the presentation. Each student will give two oral presentations, one in each of two different sections of the course.

Communication and comprehension are facilitated by a two-way flow of information. The students in the audience should ensure they understand the results presented and are encouraged to ask for clarification when necessary. The audience is expected to be familiar with the material to be presented and to contribute to the discussion of the paper. To encourage class discussion and audience participation, 10% of the final grade is awarded for participation. No participation in the discussion or no attendance for any given presentation generates a zero participation mark for that class. Any significant contribution to the discussion generates a passing mark, and additional marks are assigned for more meaningful or insightful contributions. The faculty members are present to serve as facilitators of the discussion.

Students should note results that are unclear and ensure that the presenter addresses their concerns. To encourage students to read the papers, and to allow students an opportunity to improve their concise writing skills, at the start of each class, audience members hand in a summary of the paper to be presented that day (12 pt front, double spaced, two pages maximum). Late submissions are not accepted. To improve the level of the discussion, the audience should familiarize themselves with the paper being presented, even if they chose not to write a summary of that paper.

The focus on "self-learning" and written and oral communication emphasizes the importance of these skills in continuing education. The written and verbal components of this course should improve the student’s ability to read and evaluate scientific literature while gaining a detailed understanding of several areas of virology currently under intensive investigation. Graduate students enrolled in MICI5114 are evaluated on the same basis, with the expectation that the quality of their contributions should reflect their advanced standing.

**General Course Schedule***Please consult individual detailed schedules provided before start of each section.*

*Dates Day Section Instructor*

6 January Monday Organizational class Khaperskyy

**8 January** - **M/W/F Influenza virus host interactions Khaperskyy**29 January

**31 January** - **M/W/F Genomes in conflict McCormick**26 February

**28 February** - **M/W/F Viruses and innate immunity Duguay**

17 March

**19 March** - **M/W/F Molecular biology and immunology of Flaviviruses Richardson**7 April

University Policies and Statements

**Recognition of Mi’kmaq Territory**

Dalhousie University would like to acknowledge that the University is on Traditional Mi’kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or [elders@dal.ca](mailto:elders@dal.ca). Additional information regarding the Indigenous Student Centre can be found at: <https://www.dal.ca/campus_life/communities/indigenous.html>

**Internationalization**

At Dalhousie, ‘thinking and acting globally’ enhances the quality and impact of education, supporting learning that is “interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders.” Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

**Academic Integrity**

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: <https://www.dal.ca/dept/university_secretariat/academic-integrity.html>

**Accessibility**

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (<https://www.dal.ca/campus_life/academic-support/accessibility.html>) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

**Conduct in the Classroom – Culture of Respect**

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

**Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.html>

**Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don’t follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can’t be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at: <https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html>

**Fair Dealing Policy**

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: <https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html>

**Originality Checking Software**

The course instructor may use Dalhousie’s approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: <https://www.dal.ca/about/leadership-governance/academic-integrity/faculty-resources/ouriginal-plagiarism-detection.html>

**Student Use of Course Materials**

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.