MIMM414 Fall 2025 Course Outline

Department of Microbiology and Immunology McGill University

MIMM 414 – ADVANCED IMMUNOLOGY 3 Credits

GENERAL INFORMATION

Course Coordinator

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Course Instructors

Dr. Jörg H. Fritz
Audrey Roy-Dorval (Teaching assistant)
Frederik Roth (Teaching assistant)

office hours by appointment

Prerequisites

MIMM214 & MIMM314

Registration

Students must identify to the to the departmental Undergrad Student Affairs Officer (undergrad.microimm@mcgill.ca) their wish to register, and provide documentation that supports their eligibility. Once approved, students will be able to register through Minerva.

Calendar Course Description

http://www.mcgill.ca/microimm/undergraduate/courses/mimm414

McGill Policy Statements

"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". For more information, see www.mcgill.ca/students/srr/honest/ Approved by Senate on 29 January 2003.

"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 site www.mcgill.ca/students/srr/honest/).

“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.” "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)." Approved by Senate on 21 January 2009.
"If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 514-398-6009 before you do this."
"Guidelines for the use of mobile computing and communications (MC2) devices in classes at McGill have been approved by the APC. Consult the guidelines for a range of sample wording that may be used or adapted by instructors on their course outlines."
“End-of-term 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 on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.”
"McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill.” (See the Office of Sustainability.)
In keeping with McGill's preparedness planning strategies with respect to potential pandemic or other concerns, the Administration suggests that all course outlines for the 2010-2011 academic year contain the statement: “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 (The Handbook on Student Rights and Responsibilities is available at www.mcgill.ca/files/secretariat/Handbook-on-Student-Rights-and-Responsibilities-2010.pdf).” In case students miss a quiz or project presentation. The course coordinator of instructor needs to be notified latest at the start of the class the same day.
MIMM414 adheres to the recently updated Policy on Assessment of Student Learning (PASL website) as well as to the Policy for the Academic Accommodation of Religious Observances (formerly *Policy for the Accommodation of Religious Holy Days*). Disciplinary cases of plagiarism in MIMM414 are be handled through the Code of Student Conduct and Disciplinary Procedures.

Assessments in this course are governed by the Policy on Assessment of Student Learning (PASL), which provides a set of common principles to guide the assessment of students’ learning. Also see Faculty of Science-specific rules on the implementation of PASL.

Legally mandated academic accommodations are handled by Student Accessibility and Achievement. For more information see https://www.mcgill.ca/access-achieve/

Academic considerations for assessments that are missed or late for valid reasons will be provided at the instructor's discretion. As per the new Quebec guidelines, medical notes are not required for absences of less than 5 days. **Note that repeated, similar requests for academic considerations in this course are unlikely to be granted**.

In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French 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.” (Approved by Senate on 21 January 2009)

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. (Énoncé approuvé par le Sénat le 21 janvier 2009)

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" (Approved by Senate on 29 January 2003) (See McGill's guide to academic honesty for more information).

In the event of extraordinary circumstances beyond the University's control, the content and/or assessment tasks in this course are subject to change and students will be advised of the change.

Learning Outcomes

By the end of this course, students will be able

• to synthesize and communicate key information from a scientific topic from review articles and primary research articles.

• to recognize and define problem-based scientific objectives and hypotheses in the field of *Immunology* (basic and clinical research based).

• to understand and assess immunologically relevant methods and techniques.

• to critically interpret, evaluate primary research data.

• to summarize and contextualize primary research data.

• to synthesize and communicate primary research data.

• to define novel research objectives and hypotheses and propose experimental systems to test them.

Course Content

The class room-based 3-credit research course MIMM 414 in the final undergraduate year (U3) of the MIMM program builds on learning outcomes of *Immunology* courses that have been completed in the two previous years. The courses MIMM 214 and MIMM 314 (both prerequisites for MIMM414) provided the basis for a broad understanding of basic and clinical *Immunology*. Given these foundations, the above Learning Objectives for the one-semester MIMM 414 derive from the following activities as course content and activities:

To participate at lectures and seminars, which are delivered by the course coordinator and instructors.

To acquire scientific background about a selected topic by reading and learning content of scientific publications and by analyzing research methods, tools and data that relate to the topic.

To expand understanding of the topic by accessing library-based tools for directed literature searches, leading to a comprehensive review of scientific background for the topic.

To understand a hypothesis-driven research objectives and hypotheses based on discussed primary scientific publications.

To understand the specific high-technology tools, equipment and methods used in the discussed primary literature publications and assess its strengths and limitations.

To critically interpret, summarize and contextualize research data from primary scientific literature. To identify and define a scientific and/or clinically relevant research question.

To define a hypothesis-driven research questions and propose specific aims for putative follow-up studies on discussed primary scientific publications.

To develop communication and writing skills by synthesizing a structured (Background, Objective, Hypothesis, Methods and Results, Context) half-page abstract of primary research publications.

Based on the study of recent as well as historically-relevant primary literature the course instructors will discuss selected cutting-edge topics in basic and clinical *Immunology*.

Instructional Method
A single introductory lecture will be given by the course coordinator at the beginning of the course detailing and discussing the following points: logistics of the course, concept map and course objectives, expectations and responsibilities of instructors and students, goals and reasons for the chosen methods, materials and assignments and evaluations, library tools and literature search.

Selected topics in *Advanced Immunology* will be discussed by reading and analyzing primary scientific publications (impact, recent or historically relevant); every topic has the following structure:

1. Preparation. (before the topic block) Students are expected to refresh their immunological knowledge by reviewing the book chapters and/or review articles provided and reading and studying the primary literature articles before the start of every topic block.

2. Orientation & Focusing. An orientation lecture (25-50 minutes) will be initially delivered by the instructor at the beginning of every topic, giving a broad overview of the topic followed by a specific introduction of the problem and objectives that are further discussed with the help of the provided review articles and the primary research literature.

3. Acquisition of novel knowledge from primary Research Article(s). The primary research papers will be discussed in a structured manner focusing on the following five modules.

A) Specific Background, Objectives, Hypotheses
B) Specific Research Aims, Experimental Approaches and Methodology
C) Synthesis, Evaluation and Contextualization of Research Outcomes
D) Recognition and Formulation of Novel Problems, Research Questions, Objectives, Aims and how to address them experimentally
E) Abstract-style (half page) synthesis in written and oral form of a Research Paper based on A-C.

Course Materials
For every selected topic the course coordinator together with the lecturers will refer to book chapters (to refresh and broaden context of the discussed topic) and provide review and primary research articles through MyCourses. For every topic the following list of resources will be provided to the student body by the course coordinator and the lecturers:

- Book chapter for orientation
- Recent review articles for detailed orientation
- Primary research articles
- Links and further references for enhanced readings
- Slides of the lectures

Assignments and Evaluation

The following describes how learning will be evaluated and provides guidelines for students to structure and pace their study and to gauge their progress.

30% of the grade will be based on assessments of the performance in two midterm exams (written form) where every student and will be able to practice the previously trained synthesis of knowledge based on a previously undiscussed primary research paper. Correctness of answers will be assessed based on answer key made available after the midterm.

15% will be based on attendance/participation in/to classes. Grades may be adjusted for classes missed for valid reasons. If missing was not communicated before class, it is counted as missed. Correctness of answer will not be assessed, just participation.

15% will be based on in-class project presentations. Here students will work in groups of 5-9 to deliver a 15-20 min presentation (powerpoint or comparable) in class to a given scientific topic that includes 1-2 primary research papers. Students will have to prepare within their groups, distribute and share tasks. Presentations will be assessed based on: Scientific content (comprehensive, correctness), quality and clarity of slides, delivery in class, ability to answer questions.

40% of the grade will be assigned to the final written exam where students will receive a previously undiscussed primary research paper. The task is then to synthesize the information and answer questions based on a previously undiscussed primary research paper. Correctness of answers will be assessed based on answer key made available after the final exam.

Title	Weight	Description	Due Date	Considerations and Late Penalties
Midterm Exam 1 and 2	30%	In class, multiple short answer (~ 5-10) questions to primary research paper	To be scheduled throughout the class	Missing will lead that other assessment count weigh more
Final Exam	40%	Cumulative, derivations and long answer questions (~ 15-20) to primary research paper	To be scheduled during the final exam period.	Missed final exams are handled by Service Point through a make-up final
Project presentations	15%	Students will work in groups of 5-9 to deliver a 15-20 min presentation in class	To be scheduled throughout the class	Missing will lead that other assessment count weigh more
Class Participation	15%	Participation in class through answering a short questions (~ 1-2) through MyCourses during class time	All classes after drop-in/out deadline	Grades may be adjusted for classes missed for valid reasons

Revised by Jörg FRITZ 21st August 2025