

**McGill University**  
**Department of Microbiology & Immunology**  
**Course Outline – MIMM 387 Business of Science**

**GENERAL INFORMATION**

<b>Course #</b>	MIMM 387
<b>Term</b>	Winter Year 2025
<b>Pre-requisite(s)</b>	At least one 200-level biological/ biomedical discipline course
<b>Course Schedule</b>	Mondays and Wednesdays   2:35 pm - 3:55 pm
<b>Location</b>	Lyman Duff Amphitheatre 1
<b>Number of credits</b>	3
<b>Course Coordinator</b>	George Kukolj ( <a href="mailto:george.kukolj@mcgill.ca">george.kukolj@mcgill.ca</a> )
<b>Teaching Assistant</b>	Harshita Katiyar ( <a href="mailto:harshita.katiyar@mail.mcgill.ca">harshita.katiyar@mail.mcgill.ca</a> ) – For questions, please contact through <i>myCourses</i> .
<b>Office hours</b>	By email, Zoom, Teams (easily requested and arranged)

**COURSE DESCRIPTION**

Over the past four decades, our post-industrial economies have been impacted by novel scientific discoveries particularly in the fields of digital computing and health sciences. Business and science have united to spawn new start-up biotech companies, transform established pharma companies, and provide for an unprecedented wave of scientific innovation in the health care field. Many pioneering scientific institutions have diversified their research through productive interactions between academia and industry or with other participants of the private sector. This course will present the business side of science, with an emphasis on the beneficial relationships between academia/basic/clinical science research and industry, and the process and challenges of advancing new therapeutics from bench to bedside. This course is designed to encourage dialogue between speakers and students, as well as teach students how to make quality decisions based on critical thinking when forming opinions on topics in science and business.

**LEARNING OUTCOMES**

This course offers students a rare opportunity to interact, question, and network with experts from various public and private disciplines to understand the business aspects of the health and biomedical sectors. By the end of the course, students should be able to:

- Understand the stages of advancement of basic scientific discoveries toward successful marketable products.

- Define the major steps in the pre-clinical discovery and the subsequent clinical development of therapeutic products.
- Explore the regulatory and financial challenges faced by the scientific world.
- Appreciate career paths beyond academia in the scientific field.
- Recall prior scientific knowledge to critically analyze controversial scientific issues.
- Develop a balanced viewpoint and an educated opinion on subjects when a correct response may lie in the grey area.
- Communicate an educated opinion about various policies.
- Participate in conversations about various scientific issues in the business of science.

### **INSTRUCTIONAL METHOD**

Lectures by the course coordinator and guest lectures will be delivered in person or, when necessary, via Zoom with an accompanying slide presentation. Each lecture (approximately 1 hr) will consist of a presentation covering specific topics (listed below), followed by a discussion/Q&A period with the lecturer.

### **COURSE MATERIAL AND EXPECTATION FOR STUDENT PARTICIPATION**

No textbook is required for this course. Attending the guest lectures is a course requirement. Readings and PowerPoint/PDF slides from individual lectures may be posted on *myCourses*. However, the decision to post material is at the discretion of individual guest speakers, and for confidentiality, copyright, legal, or regulatory requirements they may choose not to have the lecture slides or lecture recordings posted. Notably, materials posted on *myCourses* are for the exclusive use of registered students and you are prohibited from distributing or re-posting any of the available material. Students are expected to attend and participate in all lectures. Expressing your opinion in class throughout the semester is strongly encouraged as it creates a dynamic class environment.

### **COURSE ASSESSMENTS**

**Group presentation:** 20% of course grade

**3-2-1 Assignments:** 5% of course grade (1% each for 5 lectures of your choice)

**Midterm exam:** (Lectures 1-11): Multiple choice questions, 35% of course grade

**Final exam:** (lectures 12-26): Multiple choice questions, 40% of course grade

### **MIMM DEPARTMENT MISSED- MID TERM POLICY**

Students unable to attend the mid-term exam due to medical or non-medical reasons must submit a request for missing the exam WITHIN 1 week of the scheduled mid-term. Students who fail to do so will receive a grade of ZERO for the mid-term. Students must make the request by completing the missed mid-term exam webform available on the MIMM Department website. The Department will evaluate any medical and non-medical situations and reserves the right to make any final decisions regarding what accommodations are reasonable and appropriate in the circumstances.

The following reasons are generally accepted, provided proper documentation:

- Religious conflict
- Health/medical
- Death in the family
- Serious illness/accident in the family
- Intercollegiate event
- Job interview
- Faculty-sponsored events held outside of Montreal

The following reasons are generally **not accepted**:

- Travel not related to above issues, such as family birthdays, reunions, vacations.
- Two exams on the same day.
- Misreading of the course outline.
- Having many other exams / assignments in the same week.
- Obligations to student clubs or sports teams other than intercollegiate events discussed above.
- Employment obligations

For more information on submitting a request, please go to the Department website at [www.mcgill.ca/microimm/undergraduate-studies](http://www.mcgill.ca/microimm/undergraduate-studies)

## **AVAILABLE RESOURCES**

**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 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>

## **MCGILL POLICY STATEMENTS**

1. 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 [www.mcgill.ca/students/srr/honest/](http://www.mcgill.ca/students/srr/honest/) for more information).(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/](http://www.mcgill.ca/students/srr/honest/))."
2. 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." (approved 4 by Senate on 21 January 2009 - see also the section in this document on Assignments and

evaluation.) "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)."

3. In the event of extraordinary circumstances beyond the University's control, the content and/or the evaluation scheme in this course is subject to change.
4. McGill has policies on sustainability, paper use, and other initiatives to promote a culture of sustainability at McGill.
5. Learning support resources: Consult resources from Teaching and Learning Services (TLS) on topics such as time management, study strategies, group work, exam prep, and more. For further individualized support, check out the programs and resources offered by Student Accessibility and Achievement ([Resources for Learning | Student Accessibility & Achievement - McGill University](#)).
6. © Instructor generated course materials (e.g. handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form of medium without explicit permission of the instructor. Note that infringements of copyright can be subjected to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
7. End-of-course evaluations are one of the ways that McGill works toward maintaining and improving the quality of courses and the student's learning experience. You will be notified by email 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.
8. Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights and Responsibilities:  
<https://www.mcgill.ca/students/srr/policies-student-rights-and-responsibilities>

Date		TOPIC	LECTURER
1	M Jan 6	Introduction From Basic Science to Utility and Drug Discovery	George Kukolj PhD Adj Professor and Course Coordinator
2	W Jan 8	The Structure of a Multi-disciplinary Drug Discovery and Development Organization	George Kukolj PhD Adj Professor and Course Coordinator
3	M Jan 13	Clinical Research in Drug Development	Dr. Angela Genge, MD Executive Director of the Clinical Research Unit, MN
4	W Jan 15	Separating Sense from Nonsense in Science	Dr. Joe Schwarcz Professor, Department of Chemistry, McGill
5	M Jan 20	Discovery-to-Cure: The science of a curative antiviral therapy	George Kukolj PhD Adj Professor and Course Coordinator
6	W Jan 22	Protecting your Innovations	Mr. Christian Cawthorn Partner, Patent Agent, Norton Rose Fulbright Law Firm
7	M Jan 27	Ethical Issues in Vaccine Programs	Dr. Brian Ward, MDCM, DMT&H Research Institute – McGill University Health Centre
8	W Jan 29	The Science of Business Management (Leading Science in Academia and Industry)	Dr. Jacques Archambault Professor Dept Microbiology and Immunology
9	M Feb 3	Discovery and Development of Medical Diagnostics	Dr. Mark Miller, MD Physician Executive, Former CMO bioMerieux
10	W Feb 5	How Science and Innovation can close Health Disparity Gap in Cervical Cancer	Dr. Annie Leung, MD Asst Prof Obs. and Gyn. McGill University
11	M Feb 10	Placebo Effect	Dr. Jay Olson Psychology, University of Toronto
12	W Feb 12	MID – TERM EXAM On lectures 1-11	
13	M Feb 17	Science Business Analysis	Group Presentations
14	W Feb 20	Science Business Analysis	Group Presentations
15	M Feb 24	Evolution in Pharmaceutical R&D	Dr. Michael Cordingley PhD CSO, Transposon Therapeutics Inc
16	W Feb 26	Outsourcing and Collaborative Drug Discovery Research	Dr. Peter White Sr Vice President, Biol Sci at Paraza Pharma Inc
	M Mar 3	READING WEEK	No Classes
	W Mar 5		
17	M Mar 10	Beyond regulatory approval: navigating the complex health systems to bring novel medicines to patients	Dr. Josée Brisebois JJB Consulting; Former Head of Medical Affairs Incyte Biosciences Canada
18	W Mar 12	Science Business Analysis	Group Presentations
19	M Mar 17	Science Business Analysis	Group Presentations
20	W Mar 19	The Business of Science: A Generics Perspective	Ms. Leonor Ferreira President, Leonor Ferreira Consulting Inc
21	M Mar 24	Discovery and Development of Antiviral Antibodies	Dr. Taylor Cohen Global Project Lead at AstraZeneca
22	W Mar 26	New Drugs in MS	Dr. Jack Antel, MD Former Chairman, Neurology and Neurosurgery, MNI
23	M Mar 31	Transitioning from Academia to Industry	Dr. Laurent Sabbagh PhD Scientific Director, Domain Therapeutics
24	W Apr 2	Biotechnology Patents and Open Science	Mr. Richard Gold Professor, Faculty of Law, McGill
25	M Apr 7	Science Business Analysis	Group Presentations
26	W Apr 9	Science Business Analysis	Group Presentations