



McGill MIMM 387 Syllabus

Faculty of Science
Department of Microbiology and Immunology



“The Business of Science”

Winter 2017

Course Title:	The Business of Science
Course Number:	MIMM 387
Credits:	3
Prerequisite:	At least one 200-level biological or biomedical discipline or permission of instructor.
Location:	Duff Medical Building THTR 1
Class Time:	Monday and Friday 11:35 a.m. – 12:55 p.m.
Course Coordinator:	Dr. Robert A. Murgita (robert.murgita@mcgill.ca)
Office:	Room 408, Lyman Duff Building (4 th Floor)
Office hours:	By Appointment Only
Undergraduate Student Course Assistants (USCA):	Ashley Campbell, Hannah Seo, Pricilla Wang, Erica Marrone mcgill.mimm387@gmail.com

I. Course Description

Over the past three decades, science and business have united to give rise to innovative start-up biotech companies, which have become the driving force behind scientific innovation. It has become evident that many pioneering scientific institutions stem from a productive interaction between Academia and private investment sources. The contrasting ideologies in public and private research and the potential of private capital to accelerate innovation will also be discussed. The Human Genome Project, which represents an important model for these interactions will be analyzed. Scientists from the private sector will highlight important events that link basic research to the commercial drug discovery process. Thus, this course will reveal not only cultural differences between Pharmaceutical and Biotechnological industries, but also beneficial relationships between Academia and Industry in the complex and expensive process of moving new and novel therapeutics from bench to bedside.

High-profile academic clinicians will address controversial issues associated with therapeutic interventions and vaccine programs. Also, the interface between Law and Science will be examined by addressing intellectual property protection mechanisms, including patent, copyright protection, etc. An attorney will also discuss the interaction between microbiologist and lawyers in the litigation of hospital associated infections. The topic of journal publishing will be discussed by Dr. Eduardo Franco who has served on the editorial boards of several open-access journals.

This course is designed to encourage dialogue between the speaker and the student audience. An objective of the course is to teach how to make quality decision based on critical thinking when forming opinions on controversial topics in science and medicine. This course is not designed like other courses in this department. In this course, you are expected to speak up in class and create dialogue with the lecturers and your peers. This course will help you deal with controversial topics and you need to make such decisions in your future careers.

II. Course Objectives

Careers in the technical, clinical, legal, and managerial areas of Biotech and Pharmaceutical industries are increasingly becoming an attractive option for science graduates. However, while undergraduate students learn copious scientific facts belonging to their respective discipline, they seldom gain an opportunity to assimilate this knowledge into well-formulated concepts. In their collaboration with private industry, modern scientists require knowledge of business, law, and the rules of intellectual property protection in the form of patents and trade secrets. Therefore, this course offers students a rare opportunity to interact, question, and network with experts from various disciplines to understand the business aspects of the bioscience and health science sectors.

III. Learning Outcomes

Acquiring Knowledge:

- Understand that academia and the private sector can overlap for scientific ventures.
- Understand the transition of scientific discoveries into marketable products.
- Explore the regulatory and financial challenges faced by the scientific world.
- Learn to write an essay using conventional scientific writing skills.

Individual Productivity Skills:

- Learn to manage time to comply with set deadlines.
- Learn to seamlessly integrate divided tasks into a final coherent work.
- Learn to sort through research material and isolate key facts and data.

Critical Thinking Skills:

- Recall prior scientific knowledge to critically analyze controversial scientific issues.
- Learn to develop a balanced viewpoint and an educated opinion on subjects when a correct response may lie in the grey area as opposed to being black or white.

IV. What Is Critical Thinking?

Critical thinking is when confronted with two or more contradicting facts and must weight them. Furthermore, they can assess relevant information to communicate effectively their arguments that oppose or support the topics¹.

This class requires submitting a critical thinking essay at the end of the semester. Writing a critical essay is a prerequisite for writing any future research papers (whether academic, clinical, or even business proposals). All require fundamental components: objectives and arguments that are supported by evidence from reliable sources, a topic of interest to be analyzed from all directions (i.e., strengths and weaknesses). This essay will be a “training ground” for what you must do later in your scientific, academic, clinical, or business careers².

For more information about critical thinking and critical essays go to:

¹[https://owl.english.purdue.edu/owl/resource/685/05/;](https://owl.english.purdue.edu/owl/resource/685/05/)

²<https://www.privatewriting.com/critical-essay.>

V. Course Material

No textbook is required for this course. All readings and selected PowerPoint/PDF slides from individual lectures will be posted on myCourses. Any material that is stated to as “not testable” will not tested in any of the examinations given (The small details of certain topics is not important, just the main messages that the lecturer is trying to give). **A laptop is required to complete the assignments in-class.**

Note:

1- **Participation:** Students are encouraged to provide their own views and opinions to create a dynamic class environment. Students can access the *Content* folder on myCourses to view a short blurb and required and supplemental readings related to each lecture. It is strongly advised that students read required readings before class.

2- **Lectures will not be recorded** and selected lecture PowerPoint/PDF presentations may not be provided due to confidentiality policies agreed with lecturers from the private sector. However, any other presentations will be made available on myCourses after the lecture. Evaluation questions (i.e., on exams) will reflect the amount of information (including slides) that are given to the student. Do not expect to be asked specific questions on information that was not emphasized in class or that is not readily available to you. Lectures may be edited from the original presentation to reflect what information is testable from the lectures.

VI. Grading Scheme

(A) Quiz 1 & 2 (20% + 20%)

The two tests are closed book and consist of short answer questions. All the material presented by the lectures in class is testable. Using the additional readings posted on myCourses will help you formulate the best answers. If a student cannot write a test due to a valid medical reason, a doctor's note is required. **Without a doctor's note, a grade of zero will be given for the test.** If the first test is missed, the final assessment will be worth 30%. However, if the final assessment is missed, the essay will then be worth 40%. There are no make-up tests.

(B) In-Class Written Analyses (3 assignments: 10% + 10% + 10%):

The three assignments are held in class. They are **closed book** and consists of watching videos to answer short questions through myCourses. They require students to think critically about what is being said and what can be seen in the videos/documents. Recalling information from previous lecture material may help you formulate the best answers. There are no make-up assignments.

(C) Critical Thinking Essay (30%):

Students will be paired randomly and work together to prepare a 5-page essay on a topic that the student groups can pick from a list that will be provided. It will require readings and references from reliable sources from high impact journals to present both arguments for the topics. There will be a list of topics to choose from and then it is your responsibility to further narrow the topic to make it concise enough for the essay page limit. Refer to *Critical Essay Writing Guide* on myCourses for further information regarding the essay.

Essay Grading Criteria: All essays will be graded by Dr. Murgita. Grading is based on content, organization, coherence, depth of topic coverage, extent of literature review, proper usage of in-text citations, correct format of the "Bibliography" section, sentence structure, grammar, neatness, and style. Students must make every effort to produce an essay free from typographical or grammatical errors.

Important dates

Evaluation	Grading % Of Final Mark	Exam/Due Dates
Quiz #1	20%	Feb 24 th , 2017
Quiz #2	20%	Apr 10 th , 2017
In-Class Written Analyses	30%	Jan 16 th , Jan 23 rd , Feb 3 rd , Apr 7 th , 2017
Critical Thinking Essay	30%	Apr 7 th , 2017

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/ 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 site 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. 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).*

Lecture Schedule

DATE		TOPIC	LECTURER	
1	F Jan 06	Introduction and Overview	Dr. Robert Murgita Professor, Microbiology and Immunology	Confirmed
2	M Jan 09	University-Industry Relationships I	Dr. Robert Murgita Professor, Microbiology and Immunology	Confirmed
3	F Jan 13	University-Industry Relationships II	Dr. Robert Murgita Professor Microbiology and Immunology	Confirmed
4	M Jan 16	Reid Hoffman Interview In-Class Written Analysis (Practice)	Dr. Robert Murgita and USCAs	Confirmed
5	F Jan 20	"Cracking the Code of Life"	Dr. Robert Murgita Professor, Microbiology and Immunology	Confirmed
6	M Jan 23	In-Class Written Analysis #1	Dr. Robert Murgita Professor, Microbiology and Immunology	Confirmed
7	F Jan 27	Healthcare related infection outbreaks in the Law	Dr. Lara Khoury Associate Professor, Faculty of Law, McGill	Confirmed
8	M Jan 30	New Drugs in MS	Dr. Jack Antel MD Former Chairman of the Department of Neurology and Neurosurgery, MNI	Confirmed
9	F Feb 03	Trial and Error—The Jesse Gelsinger case In-Class Written Analysis #2	Dr. Robert Murgita Professor, Microbiology and Immunology	Confirmed
10	M Feb 06	Patents in Technology and Science	Mr. C. Cawthorn Partner, Norton Rose Fullbright Law Firm	Confirmed
11	F Feb 10	Pharmaceutical patents in an international context	Richard Gold Professor, Faculty of Law, McGill	Confirmed
12	M Feb 13	Ethical issues in vaccine programs	Dr. Brian Ward MDCM, DTM&H Montreal General Hospital	Confirmed
13	F Feb 17	How science can assist the debate about HPV vaccination	Dr. Eduardo Franco Chair, Department of Oncology, McGill	Confirmed
14	M Feb 20	The business of scientific publishing: a paradigm change for scholarly journals	Dr. Eduardo Franco Chair, Department of Oncology, McGill	Confirmed
15	F Feb 24	Exam #1		
	Feb 27 – Mar 03	Reading Week – no classes		
16	M Mar 06	Psychological misconceptions and myths in science	Dr. Amir Raz Professor, Division of Transcultural Psychiatry, McGill	Confirmed
17	F Mar 10	Heretics and conspiracy nuts in science and medicine	Dr. Joe Schwarz Professor, Department of Chemistry, McGill	Confirmed
18	M Mar 13	Generic drugs: manufacturing, pricing, and distribution	Ms. L. Ferreira Director, Government Relations, Sandoz Canada Inc.	Confirmed
19	F Mar 17	Health care system: Canada vs. United States	Dr. Antonia Maioni Professor, Department of Law, McGill	Confirmed
20	M Mar 20	Generic Pricing	Pr. Laura Lasio Assistant Professor, Department of Economics	Confirmed
21	F Mar 24	From big pharma to start-up	Dr. Cameron Black Vice President, Kaneq Pharma	Confirmed
22	M Mar 27	History of a start-up biotech company	Dr. Robert Murgita Professor Microbiology and Immunology	Confirmed
23	F Mar 31	Comparison of Biotechnology vs Pharmaceutical Industry	Dr. Robert Murgita Professor Microbiology and Immunology	Confirmed
24	M Apr 03	Innovation in biotech	Dr. Johanne Kaplan Vice President, MS and Immunology Research, Genzyme	Confirmed
25	F Apr 07	In-Class Written Analysis #4 Paper due at 5:00 pm	Dr. Robert Murgita Professor Microbiology and Immunology	Confirmed
26	M Apr 10	Exam #2		

