



# McGill MIMM 387 Syllabus

Faculty of Medicine  
Department of Microbiology and Immunology



## “The Business of Science”

Winter 2016

<b>Course Title:</b>	<b>The Business of Science</b>
<b>Course Number:</b>	MIMM 387
<b>Credits:</b>	3
<b>Prerequisite:</b>	At least one 200-level biological or biomedical discipline or permission of instructor.
<b>Location:</b>	Duff Medical Building THTR 1
<b>Class Time:</b>	Monday and Friday 11:35 a.m. – 12:55 p.m.
<b>Course Coordinator:</b>	Dr. Robert A. Murgita ( <a href="mailto:robert.murgita@mcgill.ca">robert.murgita@mcgill.ca</a> )
<b>Office:</b>	Room 408, Lyman Duff Building (4 <sup>th</sup> Floor)
<b>Teaching Assistant:</b>	TBA
<b>Undergraduate Student Course Assistants (USCA):</b>	Alice Wang, Iman Fakhri, & Ellen Parker ( <a href="mailto:usca.mimm387@gmail.com">usca.mimm387@gmail.com</a> )

## **I. Course Description**

Over the past three decades, science and business have united to give rise to cutting-edge 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 be discussed. The Human Genome Project, which represents an important model for these interactions will be analyzed in depth. 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 (1) cultural differences between Pharmaceutical and Biotechnological industries, but also (2) 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, in part, be examined by addressing the topic of hospital associated infections. National healthcare systems from three different countries will be analyzed to compare their relative efficiencies in administering healthcare services to their population.

This course is designed to be interactive and to develop the student's critical thinking. Thus, active exchange between students and lecturers during and after the presentations is encouraged.

## **II. Course Objectives**

Careers in the technical, clinical, legal and managerial areas of Biotech and Pharmaceutical industries are increasingly becoming a lucrative 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 form of patents. This is why this course offers students the opportunity to interact, question, and network with experts from various disciplines to understand the business aspect 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 a term paper using conventional scientific writing skills.

### Critical Thinking Skills:

- Leverage prior scientific knowledge or skills to critically analyze controversial scientific issues.
- Understand the manner in which facts can be misinterpreted and/or manipulated to promote a certain agenda.
- Learn to recognize information that tends to mislead the general public and avoid being drawn in to false conclusions.

- Learn to develop a balanced viewpoint and an educated opinion on subjects in which there is no wrong answer.

#### Team Building Skills:

- Learn to interact with peers in order to collaborate on ideas and produce quality work.
- Learn to recognize strengths and weaknesses of team members and assign tasks accordingly.
- Learn to manage time to comply with set deadlines.
- Learn to seamlessly integrate divided tasks into a final coherent work.

### **IV. Course Material**

No textbook is required for this course. All readings and selected power point slides for individual lectures will be posted on MyCourses.

#### **Note:**

1- **Participation:** Students are encouraged to provide their own views and opinions to create a dynamic class environment. Students can access the Lecture Preview folder on MyCourses to view a short blurb and supplemental readings related to each lecture.

2- **Lectures will not be recorded** and selected lecture presentations will not be provided due to confidentiality policies agreed with lecturers from the private sector. However, any other presentation will be made available on MyCourses after the lecture.

### **V. Grading Scheme**

#### **(A) Examinations (2 tests: 20% + 20%)**

The two tests are closed book and consist of short answer questions. All the material presented by the lectures in class and included in required readings is subject to examination. While you will not be tested on supplementary readings, they will help you in formulating 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 second test will be worth 40%. However, if the second test is missed, the final term paper will then be worth 80%. There are no make-up tests.

#### **(B) Term Paper Draft (20%):**

Please refer to "Term Paper Writing Guide" for instructions on writing the draft document.

#### **(C) Final Term Paper (40%):**

Please refer to "Term Paper Writing Guide" for instructions on writing the final term paper.

#### **(D) Bonus (+2%):**

Submit a 5-page startup plan to the McGill Dobson Cup. When you send in your business plan, cc [usca.mimm387@gmail.com](mailto:usca.mimm387@gmail.com) so that we know who is eligible for bonus points at the end of the semester. You can write the business plan as a group (a maximum of 5 people); your group may consist of people not enrolled in this class. The submission period is from January 7 to February 1, 2016. Hence, to

receive the bonus mark, you need to submit the business plan and **cc the USCAs February 1, 2016 at the latest**. For more rules on how to enter, please refer to the McGill Dobson Cup [website](#).

**Term Paper Group Assignment:** Groups of 3 students will be **randomly** assigned on January 19<sup>th</sup>, 2016.

**Term Paper Grading Criteria:** **All term papers 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 term papers free from typographical or grammatical errors.

**Submission:** The draft is due in class on **March 7<sup>th</sup>, 2016**. The final term paper is due on **April 18, 2016**. You can hand the final paper during class that day or to Dr. Murgita’s office (Lyman Duff 408) by **5pm**. Electronic copies of the draft and of the final term papers will not be accepted. No extensions of the due dates will be allowed. Late submission will be penalized.

### **Important dates**

<b>Evaluation</b>	<b>Grading % Of Final Mark</b>	<b>Exam/Due Dates</b>
Exam 1	20%	February 25 <sup>th</sup> , 2016
Exam 2	20%	April 18 <sup>th</sup> , 2016
Term Paper Draft	20%	March 7 <sup>th</sup> , 2016
Term Paper	40%	April 18 <sup>th</sup> , 2016

## **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).**

*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.**

*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	R Jan 07	Introduction and Overview	<b>Dr. Robert Murgita</b> Professor, Microbiology and Immunology
2	F Jan 08	“Cracking the Code of Life”	<b>Dr. Robert Murgita</b> Professor, Microbiology and Immunology
3	M Jan 11	University-Industry Relationships I	<b>Dr. Robert Murgita</b> Professor, Microbiology and Immunology
4	F Jan 15	Science Entrepreneurship	<b>Mr. Alexander Haque</b> President, Dobson Cup Student Executive Team, McGill
5	M Jan 18	Clinical research in drug development	<b>Dr. Rosanne Seguin</b> Clinical Study Co-ordinator and Project Manager, MNI
6	F Jan 22	New drugs in MS <b>Term Paper Groups Assigned</b>	<b>Dr. Jack Antel MD</b> Former Chairman of the Department of Neurology and Neurosurgery, MNI
7	M Jan 25	Trial and Error—The Jesse Gelsinger case	<b>Dr. Robert Murgita</b> Professor, Microbiology and Immunology
8	F Jan 29	Clinical trials in MS	<b>Dr. Amit Bar-Or MD, FRCP(C)</b> Montreal Neurological Institute
9	M Feb 01	Patents in Technology and Science	<b>Mr. C. Cawthorn</b> Partner, Norton Rose Law Firm
10	F Feb 04	Pharmaceutical patents in an international context	<b>Richard Gold</b> Professor, Faculty of Law, McGill
11	M Feb 08	Healthcare related infection outbreaks in the Law	<b>Dr. Lara Khoury</b> Associate Professor, Faculty of Law, McGill
12	F Feb 11	The business of scientific publishing: a paradigm change for scholarly journals	<b>Dr. Eduardo Franco</b> Chair, Department of Oncology, McGill
13	M Feb 15	Ethical issues in vaccine programs	<b>Dr. Brian Ward MDCM, DTM&amp;H</b> Montreal General Hospital
14	F Feb 18	How science can assist the debate about HPV vaccination	<b>Dr. Eduardo Franco</b> Chair, Department of Oncology, McGill
15	M Feb 22	<b>Review of lecture block #1</b>	<b>Dr. Robert Murgita</b> Professor, Microbiology and Immunology
16	F Feb 25	<b>Exam #1</b>	
	M Feb 29	Reading Week – no classes	
	F Mar 04	Reading Week – no classes	
17	M Mar 07	Psychological misconceptions and myths in science <b>Draft due in class</b>	<b>Dr. Amir Raz</b> Professor, Division of Transcultural Psychiatry, McGill
18	F Mar 11	Understanding Homeopathy	<b>Dr. Christine Angelard</b> Lecturer at Alternative Medicine College of Canada
19	M Mar 14	From big pharma to start-up	<b>Dr. Cameron Black</b> Vice President, Kaneq Pharma
20	F Mar 18	Generic drugs : manufacturing, pricing, and distribution	<b>Ms. L. Ferreira</b> Director, Government Relations, Sandoz Canada Inc.
21	M Mar 21	Innovation in biotech	<b>Dr. Johanne Kaplan</b> Vice President, MS and Immunology Research, Genzyme
	F Mar 25	Good Friday – no classes	
	M Mar 28	Easter Monday – no classes	
22	F Apr 01	Heretics and conspiracy nuts in science and medicine	<b>Dr. Joe Schwarz</b> Professor, Department of Chemistry, McGill
23	M Apr 04	Health care systems : Canada vs. United States	<b>Dr. Antonia Maioni</b> Professor, Department of Law, McGill
24	F Apr 08	University-Industry Relationships II	<b>Dr. Robert Murgita</b> Professor Microbiology and Immunology
25	M Apr 11	History of a start-up biotech company	<b>Dr. Robert Murgita</b> Professor Microbiology and Immunology
26	F Apr 15	<b>Review of lecture block #2</b>	<b>Dr. Robert Murgita</b> Professor Microbiology and Immunology
	M Apr 18	<b>Exam #2 &amp; Term Paper due at 5 :00 PM</b>	