

# MBA B730 Strategic Management of Technology

## Fall 2019 Course Outline

**John W. Medcof, PhD**  
**Human Resources and Management Area**  
**DeGroote School of Business, McMaster University**

### Course Objective

Apple, BMW, Boeing, Toyota, Google, Pfizer, Intel, Tata, GSK, and Bombardier are all firms that succeed through the innovative commercialization of science and technology. This course is about how they do it. Innovative business models, open innovation, digitization, globalization and sustainability are covered after an introductory survey of the strategic and management issues facing organizations in such high technology industries as aerospace, pharmaceuticals, computers, automobiles, software and electronics.

### Instructor and Contact Information

**Professor**  
John W. Medcof PhD  
[Medcof@mcmaster.ca](mailto:Medcof@mcmaster.ca)  
Office hours: by appointment

**TA**  
To be announced

### Course Elements

Credit Value:	3	Leadership:	Yes	IT skills:	No	Global view:	Yes
Avenue:	Yes	Ethics:	Yes	Numeracy:	No	Written skills:	Yes
Participation:	Yes	Innovation:	Yes	Group work:	Yes	Oral skills:	Yes
Evidence-based:	No	Experiential:	Yes	Final Exam:	No	Guest Speaker(s):	Yes

## Course Description

Students will work in teams to study the strategic and managerial issues of selected high technology industries and firms through interviews with managers, web and library research; and present their findings in oral reports to the class and written reports to the professor. Students will learn through guest speakers, lectures, videos and class discussions. This course will be of interest to students who wish to learn about, and/or work in, industries whose value proposition is based upon the innovative commercialization of technology. Previous academic work in technical fields such as engineering and science is not a requirement as the course is about technology **business**, not the specifics of technology.

## Learning Outcomes

Upon completion of this course, students will be able to do the following:

- Discuss with some sophistication the strategic/business issues faced by high technology firms
- Analyse business situations in light of those issues and propose solutions
- Describe the current state of global and Canadian high technology industries
- Contact managers whom they have met through this course

## Required Course Materials and Readings

All required materials are available on Avenue to Learn

## Evaluation

### Components and Weights

Industry Oral Briefing (Team)	10%	Oct 16
Industry Written Report (Team)	10%	Oct 30
Company Oral Briefing (Team)	10%	Nov 27
Company Written Report (Team)	10%	Dec 11
Class participation	20%	All classes
Two tests in class @ 20%	40%	Oct 23 and Dec 4

### Grade Conversion

These conversions follow the scale recommended by the School of Business for use in MBA courses.

LETTER	PERCENTAGE	POINTS	LETTER	PERCENTAGE	POINTS
A+	90.0 - 100	9	C+	60.0 - 64.9	3
A	85.0 - 89.9	8	C	55.0 - 59.9	2
A-	80.0 - 84.9	7	C-	50.0 - 54.9	1
B+	75.0 - 79.9	6	F	0.0 - 49.9	0
B	70.0 - 74.9	5			
B-	65.0 - 69.9	4			

## Communication and Feedback

Students that are uncomfortable in directly approaching an instructor regarding a course concern may send a confidential and anonymous email to the respective Area Chair or Associate Dean:

<http://mbastudent.degroote.mcmaster.ca/contact/anonymous/>

Students who wish to correspond with instructors or TAs directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Administrative Assistant.

Instructors are encouraged to conduct an informal course review with students by Week #4 to allow time for modifications in curriculum delivery. Instructors should provide evaluation feedback for at least 10% of the final grade to students prior to Week #8 in the term.

## Course Deliverables

### Team Assignments

The purpose of the team assignment is to familiarize students with high technology industries and the strategic challenges of the firms in them. This understanding provides career preparation by introducing the strategic and managerial challenges of C-level executives. Students will form teams each of which will study a high technology industry and one firm in it, then provide an oral briefing and a written report on the industry, and a separate briefing and report on its firm.

Students will form teams of 5 and email Dr. Medcof ([medcofj@mcmaster.ca](mailto:medcofj@mcmaster.ca)) providing a list of team member names (first and last), the industry they propose to study, and the name of at least one company in that industry for which they have contacts. The email will be copied to all team members. In the event that more than one team proposes an industry, the team with the earliest email transmission time will be given precedence. If a team member does not make a fair contribution to the work of the team, the other team members may remove that person from the team by informing the Professor and not including that person's name on the team's submitted work.

The high technology industries recommended for study are:

**Aerospace            Computers            Automobiles**  
**Software            Pharmaceuticals    Telecommunications**

With permission of the professor a team may choose to study a high technology industry not included in this list.

**Industry Briefing (Oral)    10%                    October 16**

These 30-minute briefings will be made to the class on the date indicated. During the first 20 minutes the team will present the most important parts of its industry written report (see below) covering its structure and strategic issues, giving more emphasis to the latter.

It will then engage the class in a discussion of the industry. All members of the team must participate substantially in the presentation. The mark for the briefing will be based 50% upon class ratings and 50% upon those of the professor. The class evaluation will focus upon presentation skills (interesting, appropriate level, clarity, poise, etc.). In addition to these, the professor's rating will consider the accuracy and depth of the content of the presentation, the presence of original analysis, the degree of participation of all members of the team, and the level of class involvement. Briefings will be formal, resembling those that are made to executives in work settings, making use of presentation technology. It is the team's responsibility to control the timing of the briefing bringing it to a conclusion at the end of 30 minutes with an appropriate wrap-up statement. An electronic copy of the slides is to be emailed to the professor on the day before the briefing, for distribution to the class. The file naming protocol for the slides is: B730 f19 industry brief aerospace

### **Industry Report (Written) 10%**

**October 23**

The parts of the written report are as follow. Each section is to start on a new page.

**Cover Page:** Shows the report title (e.g. Strategy and Structure of the Aerospace Industry), the names of all students who are to receive credit for the report, the name of the professor, the name and number of the course, and the submission date.

**Executive Summary:** Page 2. It covers the whole report, can be understood without reading any other part of the report, and is confined to one page.

**Table of Contents:** Page 3. It lists report headings and the pages on which they start.

**Introduction:** Page 4. It is no more than one page.

**Global Industry Structure:** This section outlines industry characteristics at the global level including such things as total global sales, financial performance trends in the last several years (use a figure), and major geographic markets and their relative sizes (with a visual). A table shows the global top ten firms with their sales. More qualitative descriptive information, such as degree of industry concentration, is also included. Three pages maximum.

**Global Industry Issues:** This section explains up to five industry issues *at the global level*. These are usually related to such factors as technology developments, government and regulatory issues, strategic reactions to competitive pressures, and new markets. Three pages maximum.

**Canada in the Global Context:** This section describes the state of the Canadian industry in the global context, including such things as its relative size in the global arena, its principal players and areas of product strength. It briefly explains no more than five strategic issues in Canada, some of which are different from the global issues described earlier. Three pages maximum.

**Analysis and Conclusions:** No more than two pages. ***This is an important section.***

**References:** Use the citation format used in this course outline.

**Research Method:** For example, indexes and libraries consulted, interviews conducted.

**Formal Thank You Letters:** If interviews were conducted or firms otherwise involved these pages will include formal thank you letters to the firm representatives who assisted.

The **hard copy** of the written report will be on 8.5" x 11" white paper, with 1" margins on all sides, single-spaced, 12-point font, printed back-to-back, have a cover page and be

bound with a staple. All visuals are to have a number and title, the number to be cited in the text when the visual is referred to. If a visual is taken from another source, that source is to be cited at the bottom of the visual. References made in the text of the report are to be cited using the "Endnote" function in Microsoft Word. The footer for the document will include page numbers and the filename, in this format: B730 f19 industry rep aerospace. The hard copy of the industry report is to be given to the professor in class on the date indicated and an electronic copy emailed to the professor on the same day. There is a 5% (of the mark for the report) penalty for each day it is late.

### **Company Briefing (Oral) 10%**

**November 27**

These 30 minute briefings will be made to the class on the date indicated. During the first 20 minutes the team will briefly sketch the overview and strategic issues of the firm, then focus on an analysis based upon course content and the business model of one product. In the last 10 minutes, it will then engage the class in a discussion of the analysis or business model. All members of the team must contribute substantially to the presentation. The mark for the briefing is based 50% upon class ratings and 50% upon the professor's rating. The class evaluation will focus upon presentation skills (interesting, stimulating, appropriate level, clarity, poise, etc.). In addition to these criteria, the professor's rating will include consideration of the accuracy and depth of the content of the presentation, the degree to which it includes original analysis, the degree of participation by all members of the team, and the degree to which the class was involved. The briefing will be formal, resembling those that are made to executives in work settings, making use of audio-visual aids and computer technology. It is the team's responsibility to control the timing of the briefing including bringing it to a conclusion at the end of 30 minutes with an appropriate wrap-up statement. Remember, your audience consists of "executives" who have other meetings to go to. An electronic copy of the slides for the briefing is to be emailed to the professor on the day before the briefing, for emailing to the class. The file naming protocol for the slide set is: B730 f19 comp brief aerospace

### **Company Report (Written)**

**10%**

**Dec 11**

The purpose of the company report is to present an overview of a high technology company including a discussion of the business model of one of its products. Research will be done through print, internet, and interviews with at least one person who works for the company. It is the team's responsibility to find a company. The written report will have the following parts each starting on a separate page.

**Cover Page:** Includes the report title, the names of all students who are to receive credit for the report, the name of the professor, the name and number of the course and the submission date.

**Executive Summary:** Page 2. It covers the whole report, can be understood without reading any other part of the report, and is confined to one page.

**Table of Contents:** Page 3. It lists report headings and the pages on which they start.

**Introduction:** Page 4. It is no more than one page.

**Overview of the Global Operations and Structure of the Firm:** Includes such factors as relative size, location of headquarters, geographical areas of operation, global

strategy, role of Canadian unit(s) in the global firm, location of headquarters and other Canadian units, roles of those units, Canadian strategy and role in the Canadian market. Three pages *maximum*.

**Strategic Issues Facing the Firm:** Discusses the important strategic issues facing the firm in the global and Canadian contexts with at least one issue at each level. Three pages *maximum*.

**Analysis:** At least one aspect of the company's strategy or operations must be analysed using one of the theoretical models presented in the course. ***This is an important section.*** Three pages *maximum*.

**Business Model for One Product:** A description of the business model of one of the firm's products. ***This is an important section.*** Five pages *maximum*.

**Conclusions:** One page *maximum*.

**References:** Use the citation format used in this course outline.

**Research Method:** For example, indexes and libraries consulted, interviews conducted.

**Formal Thank You Letters:** Copies of the formal thank you letters or emails to the firm representatives who assisted.

The **hard copy** of the written report will be on 8.5" X 11" white paper, with 1" margins on all sides, single-spaced with 12-point font, printed back-to-back, bound with a staple and have a cover page. All visuals are to be numbered and titled. The number is to be cited in the text when the visual is referred to. If a visual is not original the source is to be cited at the bottom of the visual. References made in the text of the report are to be cited using the "Endnote" function in Microsoft Word. The document footer will include the page number and the filename with the following protocol: B730 f19 comp rep aerospace. The hard copy of the written report is to be delivered to the receptionist in the Dean's Office at the RJC by the date indicated and an electronic copy emailed to the professor on the same day. There is a 5% (of the mark for the report) penalty for each day it is late.

### **Class Participation            20%**

Class discussions of student, professor and industry speaker presentations are an important component of the learning experience in this course. 20% of students' marks will be based upon class attendance and substantive participation in discussions.

### **Test 1                                    20%**

This in-class test will cover weeks 1 through 5 and consist of a short case and questions about the material covered in the readings and classes.

### **Test 2                                    20%**

This in-class test will cover weeks 8 through 11, only, and will consist of a short case and questions about the material covered in the readings and classes.

## **Academic Dishonesty**

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and

academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at:

[www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity)

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations

## **Language for Use in Courses with an On-Line Element**

In this course we will be using Avenue to Learn. Students should be aware that when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

## **Student Accessibility Services**

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca).

For further information, consult McMaster University's Policy for Academic Accommodation of Students with Disabilities:

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

## **Potential Modification of the Course**

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme

circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

## **Acknowledgement of Course Policies**

Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of MBA XXXX will be considered to be an implicit acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. **It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.**

Lack of awareness of the course policies **cannot be invoked** at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

## **Student Evaluation of the Course**

In accordance with School of Business policy, an on-line course evaluation will be administered near the end of this course. All students in the course are expected to complete the questionnaire. An informal course review will be held in Week #4 as per School of Business guidelines.



## Course Schedule

Weeks	Readings
<b><u>WEEK 1:</u> Sept 11 Super Technology Industries</b>	Medcof, J. (2019) <b>Chapter 1: Creating Value with Science and Technology.</b>
<b><u>WEEK 2:</u> Sept 18 Technology Commercialization Value Chain</b>	Medcof, J. (2019) <b>Chapter 2: The Technology Commercialization Value Chain.</b> Hamm et al (2008) Perfect: The Quest to Design the Ultimate Portable PC. <i>Business Week</i> , Feb 25, Issue 4072, 42-48.
<b><u>WEEK 3:</u> Sept 25 Leadership and Structure</b>	Medcof, J. (2019) <b>Chapter 3: Leadership, Structure and Technology Commercialization.</b> Cooper, R. (2017) <b>Idea-to-launch gating systems.</b> <i>Research Technology Management</i> , 60(1), 48-52. <b>Agile at Boeing</b> <a href="https://theleanviking.wordpress.com/2014/10/07/agile-at-boeing-in-1990s-the-777-program">https://theleanviking.wordpress.com/2014/10/07/agile-at-boeing-in-1990s-the-777-program</a> . Ransley, D. (1995) <b>Network more effectively with this checklist.</b> <i>Research Technology Management</i> , 38(6), 12-13. Meyer, M., Marion, T., & Crane, F. (2010) <b>Selling innovation to the C-suite.</b> <i>Research Technology Management</i> , 53(4), 15-20.
<b><u>WEEK 4:</u> Oct 2 Strategy</b>	Millar, C., Groth, O., & Mahon, J. (2018) <b>Management innovation in a VUCA world.</b> <i>California Management Review</i> , 61(1), 5-14. Jelinek, M., Bean, A., Antcliff, R., Whalen-Pedersen, E., & Cantwell, A. (2012) <b>21<sup>st</sup>-Century R&amp;D.</b> <i>Research Technology Management</i> , 55(1), 16-26. <b>Dhebar, A. (2016) Bringing new high-technology products to market: six perils awaiting marketers.</b> <i>Business Horizons</i> , 59, 713-722. Van Alstyne, M., Parker, J., & Choudary, S. (2016) <b>Pipelines, platforms, and the new rules of strategy.</b> <i>Harvard Business Review</i> , 94(4), 54-62.
<b><u>WEEK 5:</u> Oct 9 Business Models</b>	Kavadias, S. et al (2016) <b>The transformative business model.</b> <i>Harvard Business Review</i> , 94(10), 91-98. Rayna, T., and Strukova, L. (2016) <b>360° business model innovation.</b> <i>Research-Technology Management</i> , 59(3), 21-28. Girotra, K., & Netessine, S. (2014) <b>Four paths to Business model innovation.</b> <i>Harvard Business Review</i> , 92(4), 96-103. Huikkola, T. et al (2016) <b>Resource alignment in servitization.</b> <i>Research Technology Management</i> , 59(4), 30-39.
<b><u>WEEK 6:</u> Oct 16 Industry Briefings</b>	
<b><u>WEEK 7:</u> Oct 23 Test 1</b>	

Weeks	Readings
<b>WEEK 8: Oct 30</b> <b>Open Innovation</b>	<p>Chesbrough, H. (2017) <b>The future of open innovation</b>. <i>Research-Technology Management</i>, 60(1), 35-38.</p> <p>Hayes, M. (2018) <b>Who Invented the iPhone?</b> <i>Scientific American</i> Sept. 13. <a href="https://blogs.scientificamerican.com/observations/who-invented-the-iphone/?redirect=1">https://blogs.scientificamerican.com/observations/who-invented-the-iphone/?redirect=1</a></p> <p>Furr, N. et al (2016) <b>Managing multiparty innovation</b>. <i>Harvard Business Review</i>, 94(11), 76-83.</p> <p>Fuller, J., Jacobides, M., &amp; Reeves, M. (2019) <b>The myths and realities of business ecosystems</b>. <i>MIT Sloan Management Review</i>, 60(3), 1-9.</p> <p>Gawer, A., &amp; Cusumano, M. (2013) <b>Industry platforms and ecosystem innovation</b>. <i>Journal of Product Innovation Management</i>, 31(3), 417-433.</p>
<b>WEEK 9: Nov 6</b> <b>Digitization</b>	<p>Tabessh, P., Mousavidin, E., &amp; Hasani, S. (2019) <b>Implementing big data strategies: A managerial perspective</b>. <i>Business Horizons</i>, 62, 347-358.</p> <p>Subramaniam, M., Lyer, B., &amp; Venkatraman, V. (2019) <b>Competing in digital ecosystems</b>. <i>Business Horizons</i>, 62, 83-94.</p> <p>Holden, G. (2016) <b>Big data and R&amp;D management</b>. <i>Research-Technology Management</i>, 59(5), 22-26.</p> <p>Farrington, T., &amp; Alizadeh, A. (2017) <b>On the impact of digitization on R&amp;D</b>. <i>Research Technology Management</i>, 60(5), 24-30.</p> <p>Westerman, G. (2018) <b>Your company doesn't need a digital strategy</b>. <i>MIT Sloan Management Review</i>, 59(3), 1-5.</p>
<b>WEEK 10: Nov 13</b> <b>Globalization</b>	<p>Medcof, J. (2019) <b>Module 4: Global Technology Strategy</b></p> <p>Einhorn, B. (2005) <b>Why Taiwan Matters</b>. <i>Business Week</i>, May 16, 76-81.</p> <p>Engardio, P., &amp; Einhorn, B. (2005) <b>Outsourcing Innovation</b>. <i>Business Week</i>, Mar 21, 85-94.</p> <p>Von Zedtwitz, M., Ikeda, T., Gong, L., Carpenter, R., &amp; Hamalainen, S. (2007) <b>Managing foreign R&amp;D in China</b>. <i>Research Technology Management</i>, 50(3), 19-27.</p> <p>De Treville, S., &amp; Trigeorgis, L. (2010), <b>It may be cheaper to manufacture at home</b>. <i>Harvard Business Review</i>, 88(10), 84-87.</p>
<b>WEEK 11: Nov 20</b> <b>Sustainability</b>	<p>Geradts, T., &amp; Brocken, N. (2019) <b>Driving sustainability-oriented innovation</b>. <i>MIT Sloan Management Review</i>, 60(2), 1-8.</p> <p>Kramer, M. &amp; Pfitzer, M. <b>The ecosystem of shared value</b>. <i>Harvard Business Review</i>, 2010, 94(10), 81-89.</p> <p>Hynds, E., et al (2014) <b>A maturity model for sustainability in new product development</b>. <i>Research-Technology Management</i>, 57(1), 50-57.</p> <p>Metz, P. et al (2016) <b>The path to sustainability-driven innovation</b>. <i>Research-Technology Management</i>, 59(3), 50-60.</p> <p>Hopkins, M. (2009) <b>8 reasons sustainability will change management</b>. <i>MIT Sloan Management Review</i>, 51(1), 27-30.</p>
<b>WEEK 12: Nov 27</b> <b>Company Briefings</b>	
<b>WEEK 13: Dec 4</b> <b>Test 2</b>	