

Carleton University
Department of Systems and Computer Engineering
SYSC 4105 Engineering Management Fall 2007

Course Outline

Time and Location: Tuesday and Thursday, 5:30 pm – 7:00 pm, Southam Hall 416

Instructor: Professor Steven Muegge **Office:** ME 4446 **e-mail:** smuegge@sce.carleton.ca
Office hours: Friday (4 pm to 5 pm) in ME4446; Tuesday and Thursday after class.

Course Description

Introduction to engineering management: management of new products, management of manufacturing processes, management of the linkages between new products and manufacturing processes. Current theories, concepts and techniques are stressed, using a combination of readings, cases and guest speakers.

Course Objective

The objective of this course is to examine issues relevant to growing technology businesses, developing products, improving processes, and leading technology based organizations.

Prerequisites

4th year registration; students who have not satisfied the prerequisites for this course must either

- a) withdraw from the course, or
- b) submit a prerequisite waiver online at the department website – <http://www.sce.carleton.ca/ughelp>
- c) be deregistered from the course after the last day to register for courses.

Assigned Reading

The assigned reading includes one book and an assortment of articles. Students are expected to read and understand the central arguments of each assigned selection prior to attending the class at which it will be discussed.

Textbook

Christensen, C.M. & Raynor, M.E. (2003a), *The Innovator's Solution: Creating and Sustaining Successful Growth*, Harvard Business School Press.

The Innovator's Solution is available from the Carleton University bookstore. It is also stocked in the business section of most large bookstores, and is available with next day shipping from most on-line retailers. One copy is held on two-hour reserve at the Carleton University library (HD53.C493 RSV).

Articles

The following articles are assigned. Unless otherwise specified, each article is available for download from the Carleton library website using the Internet and any standard web browser.

1. Chesbrough, H. (2003). The Era of Open Innovation. *MIT Sloan Management Review*, Spring, 35-41.
2. Christensen, C.M. & Raynor, M.E. (2003b). Why Hard-Nosed Executives Should Care About Management Theory. *Harvard Business Review*, September, 66-74.
3. Clark, K.B. & Wheelwright, S.C. (1992). Organizing and Leading 'Heavyweight' Development Teams. *California Management Review*, Spring, 9-28.
4. Cooper, R.G. (1999). The Invisible Success Factors in Product Innovation. *Journal of Product Innovation Management*, 16, 115-133.
5. Friedman, T.L. (2005). It's a Flat World, After All. *New York Times*, April 3, section 6, column 1, 33.
6. Garvin, D.A. (2004). What Every CEO Should Know About Creating New Businesses. *Harvard Business Review*, July-August, 18-21.

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7. Hammer, M. (2002). Process Management and the Future of Six Sigma. *MIT Sloan Management Review*, Winter, 26-32.
8. Katz, R. (2003). Management Technological Innovation in Business Organizations. In L.V. Shavinina (Ed.), *The International Handbook on Innovation* (pp. 775-798). Elsevier Science. [This article is posted to the WebCT course website.]
9. Koenig, J. (2004). Seven Open Source Business Strategies for Competitive Advantage. *IT Manager's Journal*, May 14. [This article is available online at the following URL:
<http://management.itmanagersjournal.com/management/04/05/10/2052216.shtml?tid=85>]
10. Levitt, T. (2004). Marketing Myopia. *Harvard Business Review*, July-August, 138-149. [First published in 1960, "Marketing Myopia" is the most widely cited article in the history of HBR.]
11. Magretta, J. (2002). Why Business Models Matter. *Harvard Business Review*, May, 86-92.
12. Moore, G.A. (2004). Darwin and the Demon: Innovating Within Established Enterprises. *Harvard Business Review*, July-August, 86-92.
13. Pfeffer, J & Sutton, R.I. (2006). Evidence-based Management. *Harvard Business Review*, January, 62-74.
14. Raymond, E.S. (2000). The Cathedral and the Bazaar. [This essay is available as a PostScript file from the author's website: <http://catb.org/~esr/writings/cathedral-bazaar/>]
15. Reichheld, F.F. (2003). The One Number You Need to Grow. *Harvard Business Review*, December, 46-54.
16. Schwegmann, V. (1999). *The Alchemy of Growth – What is the formula?*, McKinsey & Company. [This article is posted to the WebCT course website.]
17. Spear, S. & Bowen, H.K. (1999). Decoding the DNA of the Toyota Production System. *Harvard Business Review*, September-October, 96-106.
18. Zider, B. (1998). How Venture Capital Works. *Harvard Business Review*, November-December, 131-139.
19. Zook, C. & Allen, J. (2003). Growth Outside the Core: Expanding into Adjacent Markets. *Harvard Business Review*, December, 66-73.

To access journal articles in electronic form, go to the website for the Carleton University Library Catalogue (<http://catalogue.library.carleton.ca>). Type the title of the journal (not the article) into the search field, select "Web resource" from the pull down menu to the right, and click the "Search" button. The catalogue record for the journal will appear on your screen. Click on one of the links below the "Connect to Web Resource" heading. You may be asked to enter your Patron barcode number and PIN. You will then be connected to a database containing all the articles published in that particular journal. Browse the journal contents or use the database search tools to locate the particular article of interest.

Grading Scheme

Each student is required to write a take-home final examination, work in groups to complete a term project and one assignment, and write two in-class tests. The course grade is weighted as follows:

In-class tests (2 @ 10% each):	20%
Take-home assignment (group effort):	10%
Term project presentation (group effort):	10%
Term project (group effort):	30%
Take-home exam (individual effort):	30%

The take-home exam is an individual effort. All written work is to be that of the individual student.

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Term Project

The term project is a group effort. As soon as possible, students should form into groups of 3-5 students.

Requirements

1. Describe a technology company with which you are familiar or establish one if you don't know any. It could be a new venture, an established incumbent, or a business unit within a large firm.
2. Use the readings as a guide to prepare a growth plan for the company.
3. Describe the current situation, the goal to be achieved, and the highlights of each stage of growth.

Style Guidelines

- 1 page executive summary
- 12 pages body (maximum), 12 point font, 1" margins, 1.5 spacing.
- Pages should be numbered at the bottom of each page.
- Use figures and tables appropriately. Include a diagram or table that provides a visual roadmap to guide the reader from your starting point to your goal.
- You may include as many appendices as you like.
- The final report should be fully referenced with citations to all sources.

Deadlines

Students are required to submit the names of group members in the fifth class (September 20), provide a two-page status report in the tenth class (October 9), schedule and attend a brief status meeting with the instructor or a teaching assistant outside of class time prior to the seventeenth class (November 1), deliver a concise oral presentation during class eighteen or nineteen (November 6 or November 8), and submit a final report in the twenty-third class (November 22).

Grading

To receive the same grade assigned to the group, your name must appear in the first page of the final report. If your name does not appear in the first page, you will receive a grade of zero for the term project. Groups are not to include the names of people who did not fulfill their commitments to the group.

Students with Disabilities

Students with disabilities who require academic accommodations in this course are encouraged to contact the Paul Menton Centre for Students with Disabilities to complete the necessary forms. After registering with the Centre, make an appointment to meet with me in order to discuss your needs at least *two weeks before the first in-class test*. This will allow for sufficient time to process your request. The Paul Menton Centre deadline for submitting completed forms for accommodations for formally scheduled exams is November 9th, 2007.

Plagiarism

Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offence that will not be tolerated. Please refer to the section on instructional offences in the Undergraduate Calendar.

The following reference provides useful advice on recognizing and avoiding plagiarism:

<http://www.sce.carleton.ca/courses/94588/plagiarism.htm>

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Calendar (tentative) – changes may be announced during the term

	Date	Topic	Assigned Reading	Notes
1	Thu Sep 6	Intro and expectations		
2	Tues Sep 11	Management theory; evidence-based mgmt.	Christensen & Raynor (2003b); Pfeffer & Sutton (2006)	
3	Thu Sep 13	Patterns of innovation and dominant designs	Katz (2003)	Guest speaker (innovation)
4	Tues Sep 18	Open environments; stages of growth	Friedman (2005); Chesbrough (2003); Garvin (2004)	Guest speaker (business plan competitions)
5	Thu Sep 20	Growth strategies and tools	Schwegmann (1999); Zook & Allen (2003)	Guest speaker (growth) Group composition is due.
6	Tues Sep 25	Anchors and infrastructure	Levitt (2004/1960); Reichheld (2003)	Guest speaker (growth)
7	Thu Sep 27	Market segmentation and business models	Magretta (2003); Moore (2004)	
8	Tues Oct 2	Quiz #1 / term project workshop		
9	Thu Oct 4	Entrepreneurship		Guest speaker (entrepreneurship)
10	Tues Oct 9	Disruptive Innovation	<i>The Innovator's Solution</i> (ch. 1-4)	Status report is due.
11	Thu Oct 12	Product architecture	<i>The Innovator's Solution</i> (ch. 5-6)	
12	Tues Oct 16	Case discussion	Links posted to course website.	
13	Thu Oct 18	Open source software	Raymond (1999); Koenig (2004)	Guest speaker (OSS)
14	Tues Oct 23	Organizing for growth	<i>The Innovator's Solution</i> (ch. 7-8); Cooper (1999)	Assignment is due.
15	Thu Oct 25	Financing innovation	Zider (1998); <i>The Innovator's Solution</i> (ch. 9)	Guest speaker (financing)
16	Tues Oct 30	Intellectual property		Guest speaker (IP)
17	Thu Nov 1	Quiz #2 / presentation skills workshop		
18	Tues Nov 6	Project Presentations		
19	Thu Nov 8	Project Presentations		
20	Tues Nov 13	Effective leadership	Clark & Wheelwright (1992); <i>The Innovator's Solution</i> (ch. 10)	
21	Thu Nov 15	Process management	Hammer (2002)	
22	Tues Nov 20	Process management	Spear & Bowen (1999)	
23	Thu Nov 22	Term project due; final exam distributed		
24	Tues Nov 27	No class		
25	Thu Nov 29	Final exam due.		