

# **SYSC 4105 Engineering Management**

**Fall 2003-2004**

**Department of Systems and Computer Engineering  
Carleton University**

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Classes: Monday and Wednesday, 4:05 to 5:25 p.m.  
3380 ME

## **Office Hours**

Office hours are from 5:30 to 6:30 p.m. on Monday and 5 to 6 p.m. on Tuesday. The instructor is also available via e-mail any time.

## **Calendar Description**

SYSC 4105 [0.5 credit] (formerly 94.415\*)  
Engineering Management

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.

Prerequisite: fourth-year registration.

Students may be deregistered if they do not meet the course prerequisite.

## **Course Objectives**

The objective of this course is to examine the latest developments in:

- growing businesses
- product development
- process improvement
- leadership in technology-intensive environments

Key questions to be addressed in this course are:

1. what do you need to know and do to grow a business?
2. what do you need to know and do to lead fast-to-market product teams?
3. what do you need to know and do to improve product development processes?
4. what do you need to know and do to lead product development teams?

## **Required Readings**

Students need to read the following two books and two articles:

### Books

1. Baghai, Mehrdad, Stephen Coley and David White (2000) *The Alchemy of Growth*, Perseus Publishing; ISBN 0-7382-0309-2
2. Pande, Peter S, Robert P. Neuman, and Roland R. Cavanagh (2002) *The Six Sigma Way Team Fieldbook: An Implementation Guide for Process Improvement Teams*, McGraw Hill; ISBN: 0071373144

### Articles

1. Brown, Shona L. and Kathleen M. Eisenhardt (1995) "Product Development: Past research, present findings and future directions", *Academy of Management Review*, 20(2), 343-378
2. Carlsson, Bo, Staffan Jacobson, Magnus Holmén, and Annika Rickne (2002) "Innovation systems: analytical and methodological issues," *Research Policy* 31: 233-245.
3. Malerba, Franco (2002) "Sectoral systems of innovation and production", *Research Policy* 31 (2002) 247-264.

## Class Sessions

Each student is responsible for coming prepared to discuss readings and make presentations

## Student Evaluation

Each student is required to write a take-home examination and to work in groups of 2-6 students to complete two assignments. To determine the course grade, these weights apply:

Assignment One: Innovation system 40%	Assignment Two: Process Improvement 30%	Take-home Examination 30%
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To receive the same grade assigned to the group, your name must appear in the first page of the assignment. If your name does not appear in the first page of the assignment, you will either receive a grade of zero or the grade on the “group assignment” you did on your own. Groups are not to include the names of people who did not fulfill their commitments to the group.

### Assignment One: Innovation System (40%)

1. Read:
  - Malerba, Franco (2002) “Sectoral systems of innovation and production”, Research Policy 31 (2002) 247-264.
  - Carlsson, Bo, Staffan Jacobson, Magnus Holmén, and Annika Rickne (2002) “Innovation systems: analytical and methodological issues,” Research Policy 31: 233-245.
2. Select a system of innovation
3. Use the readings as a guide to describe the evolution of the system of innovation you have selected
4. Show highlights of each stage of the technology life cycle

Make sure that you provide references to support your work.

#### Due dates

1. Mon, Sep 29 Written notification of group composition
2. Wed, Oct 15 Status report, 2 pages max and short presentation
3. Wed, Oct 29 Presentation to class
4. Mon, Nov 10 Submit 15 pages of body maximum. You can add as many appendices and references as you’d like.  
I expect a professionally written report: interesting, clear, concise, and well organized.

### Assignment Two: Process Improvement (30%)

You are asked to:

1. Describe an organization that develops products with which you are familiar
2. Learn about Six Sigma and Malcolm Baldrige. The required book can be used to learn about Six Sigma. To learn about Malcolm Baldrige go to <http://www.quality.nist.gov/>
4. Read Brown, Shona L. and Kathleen M. Eisenhardt (1995) “Product Development: Past research, present findings and future directions”, Academy of Management Review, 20(2), 343-378.
3. Make recommendations on how to improve the organization described above using Six Sigma or Malcolm Baldrige and the findings in the Brown-Eisenhardt article.

#### Due dates

1. Mon, Sep 29 Written notification of group composition
2. Wed, Oct 15 Status report, 2 pages max and short presentation
3. Wed, Nov 19 Presentation to class
4. Wed, Nov 26 Submit 10 pages of body maximum. You can add as many appendices and references as you’d like.  
I expect a professionally written report: interesting, clear, concise, and well organized.

**Exam**

The take home exam is an individual effort.

The exam will be distributed on Mon Nov 24 and is due on Mon Dec 1, at 4 p.m.

**Group Work**

Group work is an important component of this course. You may elect to work in the same group to prepare both assignments or work in two different groups.

Group conflicts are to be dealt with by the group in a way that is fair, fast and without personal attacks.

**Free-loaders**

Free-loaders are not welcome anywhere. This course is no exception. The best way to deal with free loaders is to not include their names in the first page of the group assignments. If a student's name does not appear in an assignment submitted by his or her group, the student must submit his or her own assignment. See Student Evaluation above. There is zero tolerance for free loaders.

**Students with Disabilities**

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre (PMC) for Students with Disabilities to complete the necessary *letters of accommodation*. After registering with PMC, make an appointment to meet and discuss your needs with your instructor at least two weeks prior to the midterm exam. This is necessary in order to ensure sufficient time to make the necessary arrangements. Please note the following deadlines for submitting completed forms to the Paul Menton Centre: November 1 for Fall term courses.

**Plagiarism**

Passing the work of others as if it was your own is a serious offence. There is zero tolerance for plagiarism.

**Other Books you May Want to Read**

1. Clark, Kim B. and Steven C. Wheelwright (1992) *Managing New Product and Process Development: Text and Cases*. Free Press; ISBN: 0029055172.
2. Cooper, Robert G. (2001) *Winning at New Products: Accelerating the Process from Idea to Launch*, 3<sup>rd</sup> edition, Perseus Publishing; ISBN: 0738204633
3. Downes, Larry and Chunka Mui (1998) *Unleashing the Killer App*, Harvard Business School Press; ISBN: 087584801X
4. Fine, Charles (1998) *Clock Speed: Winning Industry Control in the Age of Temporary Advantage*, Perseus Books; ISBN: 0738201537
5. Flicker, Barry (2002) *Working at Warp Speed: The New Rules for Project Success in a Sped-Up World*, Berrett-Koehler Publishers; ISBN: 1576751465
6. Gleick, James (1999) *Faster: The Acceleration of Just About Everything*, Pantheon Books; ISBN: 0679408371.
7. Jolly, Vijay K. (1997) *Commercializing New Technologies*, Harvard Business School Press, ISBN: 0875847609
8. Patterson, Marvin L. and Sam Lightman (1997) *Accelerating Innovation: Improving the Process of Product Development*, John Wiley & Sons; ISBN: 0471285463..
9. Pittiglio, Rabin, Todd and McGrath *Setting the PACE in Product Development: A Guide to Product and Cycle-time Excellence*, Revised Edition, Michael E. McGrath, Editor
10. Smith, Preston G. and Donald Reinertsen (1998) *Developing Products in Half the Time, New Rules New Tools*, 2<sup>nd</sup> edition, John Wiley & Sons; ISBN: 0471292524.
11. Ulrich, Karl and Steven D. Eppinger (1995) *Product Design and Development*. McGraw Hill College Div; ISBN: 0070658110.

### Better Journals

Management Science; Organization Science; Journal of Product innovation Management; Academy of Management Journal; Academy of Management Review; Administrative Science Quarterly; IEEE Transactions on Engineering Management; R&D Management

### Class by Class Schedule and Due Dates

	Day	Topic	Due	Baghai, Coley & White	Pande, Neuman & Cavanagh	Articles
1	M, Sep 8	Getting started				
2	W, Sep 10	Technology life cycle				
3	M, Sep 15	Systems of innovation				Malerba
4	W, Sep 17	Systems of innovation				Carlsson
5	M, Sep 22	Product development literature				Brown and Eisenhardt
6	W, Sep 24	Product development issues				Brown and Eisenhardt
7	M, Sep 29	Growth's three horizons	Group composition	1-2		
8	W, Oct 1	Earn the right to grow		3		
9	M, Oct 6	Growth opportunities		4		
10	W, Oct 8	Staircase to growth		5		
11	M, Oct 13	Holiday				
12	W, Oct 15	Securing advantage	Status report	6		
13	M, Oct 20	Execution and growth management		7, 8, 9		
14	W, Oct 22	Intro to Six-sigma			1,2,3	
15	M, Oct 27	Selection and toolkit			4, 5	
16	W, Oct 29	Assignment 1 presentations				
17	M, Nov 3	Opportunity definition			6, 7, 8	
18	W, Nov 5	Measurement			9, 10, 11	
19	M, Nov 10	Analysis	Assignment 1		12, 13, 14	
20	W, Nov 12	Improving			15, 16, 17	
21	M, Nov 17	Controlling			18, 19, 20	
22	W, Nov 19	Assignment 2 presentations			21	
23	M, Nov 24	Process design	Exam handed out			
24	W, Nov 26	Tech ventures	Assignment 2			
25	M, Dec 1	Tech ventures	Exam			

Note: November 7 is the last day to withdraw from fall-term courses. It is also the last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for December examinations.