APS1012 – Managing Business Innovation and Transformational Change-
Offered as a 10 Half Day Spring (9AM- Noon) Week 1- **Inclass,** Week 2 - No Class (work on team Project), **Week 3 - Inclass,** Week 4 - No Class – work on team project)

Course Outline

"Science aims to understand nature and engineering, is about creating what has never been".
Theodore Von Karmen

Innovation is the transformation of knowledge into products, processes, and services and is critical to economic competitiveness, long-term productivity growth, and wealth creation. Since the beginning of the industrial revolution in the 18th century Engineers emerged as the key drivers of national and international innovation and quality of life. By the middle of the 19th century engineering began to professionalize around functional disciplines that where designed around the underlying engineering science. Currently powerful forces, including demographics, globalization, and rapidly evolving technologies are dramatically changing the nature of engineering practice demanding far broader more integrative skills than simply the mastery of scientific and technological disciplines. 21st century challenges consist of complex system problems including transportation, communication, security, aging population, energy production and distribution, environmental remediation and sustainability. The 21st century engineering profession must transition toward a model built on discovery, innovation and entrepreneurship. This will require Engineers to move beyond the traditional foundation in pure sciences, mathematics, and engineering sciences to be drivers of strategic innovation and policy formation – **in a nutshell to *"Engineer"* strategic change.   This course will equip students with the knowledge and the skills to manage innovation at strategic and operational levels whether as CEO's, VP's, entrepreneurs or as C-Level management consultants**
        The *"Managing Business Innovation and Transformational change"* course will provide students with the core concepts of innovation including; strategic thinking and Business Strategy, transformational change management, design & development of an innovative enterprise, Future State Visioning, and Sustaining a Culture of Innovation. The management of Business innovation is interdisciplinary and multi - functional, requiring the alignment of market forces, technological systems and organizational change to improve the competitiveness and effectiveness of organizations and society. We shall argue that the process of business innovation management is essentially generic, although organization, technological and market specific factors will require tailoring direction and actions. This course will incorporate both academic readings to provide the broad theory of innovation but most of the readings and discussion will be based on the instructors many years of hands on practical experience in the management of innovation in a variety of industry sectors.

> ➢ **There are two books for the course that will serve as <u>common reading each week</u>**: 1) <u>Engineering and Product Development Management – The Holistic Approach</u> (Cambridge University Press, 2001), and 2) <u>Sustaining Continuous Innovation Through Problem Solving</u> (Industrial Press, New York 2008) – this book will also be the main reading for the Applying Innovation course APS1013. Full disclosure: I wrote both of these books. For each module students will read the common reading (in bold type). <u>**The chapter readings for each day are provided in the agenda for each module. The**</u>

course has been structured around both books and the requirement to read and comment each day is extremely important.

Other books available online that we will review are:

➢ Kahn Kenneth B, Editor and associate editors, George Castellion, Abbie Griffin; **The PDMA handbook of new product development [electronic resource]** Hoboken, N.J. Wiley, c2005. 2nd ed. xiii, 625p: ill. Robarts Stacks HF5415.153 .P35

➢ Morris, Langdon; **Permanent Innovation:** Innovation Labs LLC 2006, E Library Downloaded from Blackboard - Module 0

There are no mandatory prerequisites but previous course work or experience in leadership, process management, project management, continuous improvement (six sigma, lean), strategic management, organizational change management, lean product development or operations management would be helpful.

Course Objectives

Upon course completion, the participants will be able to:

• Establish a context for Business Innovation and its dimensions
• Analyze the elements of Business Innovation as a key organizational capability
• Explain how innovations are diffused across cultures
• Identify how to develop an innovative future state vision through systems thinking
• Develop and prepare an organization for an innovation transformation initiative
• Explain and assess a culture of innovation for readiness to change
• Identify how to overcome the barriers to innovation in organizations
• Develop the key leadership roles in managing innovation at the group/department, division, and corporate levels
• Develop an integrated enterprise approach to innovation
• Design an Innovation delivery system for various environments
• Apply process management and project management practices to product development
• Organize and develop integrated Project / Product teams (IPT's) for project execution
• Deploy and Embed an innovation process through the core culture
• Continuously assess the "As Is" business processes
• Continuously improve the "As Is" process through structured problem solving
• Apply the key strategies to engage the people to sustain an innovative culture
• Identify challenges in measuring and maintaining innovation performance

Course Structure and Content: Managing Business Innovation, and Transformational Change is divided into four themes and 12 modules over 10 days:

• The **first theme (Day1-3)** is establishing a context for **Business Innovation** that will include numerous case histories of companies managing certain types of technological change. We will discuss various kinds of innovation and innovation diffusion through the ages.

• The **second theme (Day4-5)** is; **Design and Developing an Innovative Enterprise.** The sources of success for great companies lie in what they do very well. The business strategy, and model that has created great success can also be a barrier to change, as well as a source of advantage. **Disruptive Technologies** fundamentally challenge the company's current state business model – which is why they are so disruptive. We will discuss the approach to transformational change including future state visioning, business

process management, overcoming resistance to change, systems thinking, and effective teams
- The **third theme (Day 6-9)** examines; **Building the Innovation Management Process**. Once we understand how to overcome the barriers to change, we must then find out how companies can organize to achieve an innovative culture that can deliver the value proposition. We will examine how to design an innovative process management system that allows a company to design and build products more effectively and launch new products effectively. We will examine enterprise processes in variety of industry sectors (Aerospace –Military and Commercial, Food, Machinery, Newspapers). We will examine the integration of standard project management techniques with process management.
- The **fourth theme (Day 10-12)** considers; **Sustaining the Innovative Lean Enterprise**. Once we understand how to overcome the barriers to change, we must then find out how companies can sustain an innovative culture. We will examine how to continuously analyze and improve business processes and business strategy models. Central to achieving this culture is to embed systematic problem solving at the heart of day-to-day operational activities.

Learning outcomes

Knowledge and Comprehension:
- ➢ Understand the central features of the management of business innovation at the operational and strategic levels, specifically the relationships between market, strategy, technological and organizational change, and how it contributes to the competitiveness of firms.
- ➢ Explain the various parts of the innovation business process and their interaction

Intellectual Skills (Analysis and Synthesis)
- ➢ Students will develop an integrated enterprise framework for strategic thinking to analyze the process of innovation in a wide range of organizational, technological and market contexts.

Practical Skills (Application and Evaluation)
- ➢ Students will develop the awareness of the application of innovation methodologies to assess and improve organizations
- ➢ Assess the likely success of innovation initiatives in various organizations
- ➢ Be able to think, write and communicate critically

Class Participation. This course will be offered in two modes: over 10 days and 100% Online. The course will be taught through a combination of video lectures (15-50 minutes), critical review readings, and **in-Class activity and discussion.** In-class activity includes presentations and discussions that will be delivered as teams each day. Teams will present answer to questions set against each module video (listed in discussion board).

Critical Review (CR) Papers. **The requirements for CR's change from year to year.** CR papers can be handed in and also posted on the discussion board. **All CR's will be written papers (800 – 1200 words).** Critical reviews will consist of reviewing an academic paper and / or **special interest topic** that is most likely career related. There are lots of choices for the

critical reviews as follows; the "**_Product Development Management Association_**" handbook (available electronically), book "**_Permanent Innovation_**" by Langdon Morris (available electronically - uploaded onto blackboard).   The remainder of the critical review readings can be from scholarly academic papers listed on the course website (blackboard). There are lots of choices – students can also find and review the latest academic papers on innovation.

Final Paper - Project Report. Students will form teams and produce a team report. Whether in a virtual team environment or as an individual the level of effort is the same. For the final paper you are free to select a topic in innovation that interests you. The goal of the final project report is <u>not</u> to do original field research, but to demonstrate to me your ability to apply innovation concepts *in a situation of your choosing*. The final report should be double-spaced, 12 point font, **(**approximately 1200 – 1500 words per student**).** Timing is very important to Managing Innovation! **A hard copy and a soft copy of the paper** (using Microsoft Word, NOT an Adobe Acrobat PDF!) must be delivered by email no later than **end of June at 4pm** to my email address, stephenc.armstrong@utoronto.ca - the hard copy to be given to the mechanical & industrial engineering graduate office
Please note: for guidance purposes – executive summaries of team project reports from 2010 to today are available on my web site at:
http://www.amgimanagement.com/founder/teaching.html.

Course Grading (10- Half Day Version): The components of the final course grade will be weighted as follows:

Final Team Report (5% Charter and Summary ppt 10%)	40%
In Class Participation (team presentations and discussions)	40%
Critical Review of Academic Paper (CR1)	10%
Written Book or Special Interest Review (CR2)	10%

40% will be determined by the final project team paper (includes 10% for summary ppt presentation and 5% charter). 50% of the grade will be determined by Class activity Participation –blackboard discussion board **is not required** but this is where readings and module discussion questions are located. 10% is a book or special interest review (between 1,000-1,500 words). **The 100% Online has a different grading structure.**

Office Hours. Because I am Adjunct faculty it will be difficult to meet all of you individually in a timely manner because of the class size but we will have lots of interaction in class

Important Milestones: See Quercus for Dates by Semester

> ➢ First Seminar: Orientation on Course Content
> ➢ Final date to drop APS1012 without academic penalty
> ➢ Charter Due- Submit physical copy in class
> ➢ Last Module and submission of Special Paper Review
> ➢ Project team verbal presentations (Power point)
> ➢ Submission of final report (physical hardcopy and e-copy in word)
> ➢ All coursework grades submitted

Part I – Innovation in Context

Mod 1 –: Orientation, instructor background, syllabus overview, & assignments

- ➢ Overview of the entire course
- ➢ Grading structure (Critical Reviews, Book Review, Discussions, Projects)
- ➢ Web site layout and operation
- ➢ Project team formation and operation – Review past projects
- ➢ Critical Thinking and Performance Rubric
- ➢ Course Value in Career Planning – Levels of Management Thinking

Mod 2 –: Dimensions of Innovation

- ➢ Global market trends
- ➢ Sources of Innovation (internal and external)
- ➢ Types of innovation – product, process, organizational, and business model
- ➢ Innovation environments – manufacturing, service, public sector
- ➢ Degrees of Innovation Disruptive, Radical, incremental

Mod 3 –: Diffusion of Innovation

- ➢ Introduction to Social Evolution and Innovation
- ➢ Introduction to the History of Engineering and societal impact
- ➢ Diffusion of Innovation theory

Part 2 – Developing an Innovative Enterprise

Mod 4: -: Designing and developing an Innovative Lean Enterprise through Business Transformation **(Sustaining: Chapter 1,2)**

- ➢ What is transformational change?
- ➢ What is an Innovative Enterprise?
- ➢ How do we design and develop it?
  - ▪ Directional planning and future state visioning
  - ▪ Business process Analysis
  - ▪ Business process design and infrastructure alignment

Mod 5 –: Organizational Approach to Cultural Transformation   **(Sustaining: Chapter 3)**

- ➢ Building an innovative culture
- ➢ Motivating teams and individuals
- ➢ Recognizing and overcoming systemic barriers
- ➢ Understanding organizational politics
- ➢ Fostering organizational learning
- ➢ Roles and responsibilities in a transformation project

Part 3 – Building the Lean Innovation Management Process

<u>**Mod 6** –: Enterprise Integration and Process Management</u>   **(Eng & Product: Chapters 1,2,3)**

- ➢ Enterprise wide process modeling and the supply chain
- ➢ New product development in various environments – the use of the stage gate method
- ➢ Systems engineering approach applied to enterprise process integration
- ➢ Process and workflow analysis
- ➢ Design and Systems thinking

<u>**Mod 7** –:</u> Integrating Process, Project, Programme Management & IPT's **(Eng & Product Chapters 4, 5,6)**

- ➢ Roles and responsibilities in a process driven enterprise
- ➢ Programme and Project Management in a Process Driven Enterprise
- ➢ Concurrent engineering and collaborative product development concepts
- ➢ Effective Integrated Project team (IPT's)

<u>**Mod 8** –:</u> Lean Product Development and Knowledge Management   **(Eng & Product Chapters 7,8,9,10,11)**

- ➢ Deliverables Architecture and Knowledge Management
- ➢ Rules and Set based Product Development
- ➢ Programme structuring and planning
- ➢ Risk management
- ➢ Project initiation and execution
- ➢ Engineering change and programmed reviews

<u>**Mod 9** –:</u> Deploying and embedding the innovation process **(Eng & Product Chapters 12, 13)**

- ➢ Management of Change
- ➢ Organizing for deployment
- ➢ Overcoming resistance to change
- ➢ Role of an external management consultant as facilitator, coach and change agent

Part 4 - Sustaining the Innovative Lean Enterprise

<u>**Mod 10** –:</u> Continuous Analyses of the "As Is" / "To Be" Business Process **(Sustaining Chapter 4)**

- ➢ Researching customer needs
- ➢ Selecting and Prioritizing Issues
- ➢ Defining / designing Processes – Value Stream Mapping
- ➢ Establishing standards and performance measures
- ➢ Setting objectives for improvement

<u>**Mod 11** –:</u> Continuous Improvement through Structured Problem Solving **(Sustaining Chapter 5)**

- ➢ Problem Identification

➢ Root Cause analysis
➢ Data gathering an root cause analysis
➢ Problem Solving Tools and Techniques
➢ Formulating and selecting alternative solutions
➢ Documentation and implementation

Mod 12 –: Maintaining an Innovative Culture **(Sustaining Chapters 6, 7, Afterword) - Discussion Board**

➢ Learning Organization
➢ The Organization as a Living System
➢ Mechanics of effective teams
➢ Effective meetings
➢ Facilitator's role
➢ Integrated thinking
➢ Finding a higher purpose

Last Day of Class Also Team Summary (PPT) Report - Live Presentation:

Optional Advanced Modules – More Specialized

Module 13 - Product Innovation Management

Module 14 - Final Team Project Management and Development

Module 15 - Innovation Dynamics and Industrial Change

Module 16 – Design, Systems, and Strategic Thinking

Module 17 - Knowledge Management

Module 18 - Leadership and Management for Innovation

Module 19 - Product Lifecycle Management

Module 20 - Business Process Management and Innovation

Module 21 - Fuzzy Front End and New Product Development

Module 22 - Social Evolution and Diffusion

Module 23 -Foresight Management and Development

Module 24- Innovation Drivers & Sources

Module 25-Innovation Drivers By Industry

Module 26 - Innovative Nations & National

Module 27- Innovation Gurus & Innovative Companies

Module 28 -Types of Innovation – Case Studies

Module 29-Technology Management and Innovation

Module 30 - Innovation in Consulting

Module 31 - Innovate Frameworks

Module 32 - Global Market Trends & Management of Global Change

Module 33 – Socio-Political Management

Module 34 -Entrepreneurship & Innovation