INSY 455- Technology and Innovation for Sustainability

Winter 2015, Mondays, 11.35am – 2.25pm, Bronfman 178

General information

Instructors: **Emmanuelle Vaast & Jeroen Struben**
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Office hours Mondays, 11.00am – 11.30am
Or by appointment, previously scheduled by email

Course Description

The course provides students with theoretical and practical resources to understand how technology and innovation can help organizations achieve sustainability in a competitive environment. The course details the challenges of managing technology and innovation in a sustainable way and/or for sustainability. Throughout the course we reflect on questions of how technology may impact organizations and society striving for a sustainable future from various vantage points and imperatives. We consider ambiguous policy implications.

Learning objectives

The course highlights current issues such as the role of technology and, in particular Information Technology (IT), in the current carbon footprint of the economy and of efficiencies and inefficiencies in organizational processes. It also deals with how strategic innovation can help contribute to sustainable development through digitization, recycling, reuse of materials. The course engages with issues associated with sustainable design and innovation. Doing so, it touches upon issues such as LEED certifications, smart grids, and metrics of energy savings, as well as alternative fuel vehicles and alternative mobility that are of high relevance to socially responsible leaders, managers and organizations today.

The course also visits the pitfalls of such "solutions". Technologies and innovation for sustainability are by nature multifarious and complex. Proposed benefits are often hard to measure and can be challenged. Solutions that seem beneficial, may turn out to be less so in the longer-run, or when analyzed from a broader perspective. Concomitantly,

while potentially promising, novel technologies and ideas are often controversial and contested. Finally we will examine the role of organizational stakeholders – internal and external– in affecting the selection and implementation of solutions. The course explores organizational strategies considering the role of legitimation, acceptance and contestation of technologies for sustainability and the role of maturation trajectory of technologies and innovation for sustainability in general, within their organizational and broader institutional context.

Learning outcomes:
The course will provide students with the opportunity to:

- ✓ Understand the role of technology and innovation as it impacts the global carbon footprint
- ✓ Understand the societal and global opportunities associated with sustainable technologies and innovations.
- ✓ Understand the different approaches that organizations may take with regard to green IT, and assess their economical, ecological, and ethical impacts
- ✓ Become aware of some of the unanticipated consequences of technological innovations, and the role of the "precautionary principle" and its implications for sustainability
- ✓ Understand and apply the concept of technology life-cycle and how this is affected by sustainability demands, and its implications for organizational innovations.
- ✓ Recognize market failures as a source of innovation opportunities at various market and government levels.
- ✓ Understand how variation in regulation and different contexts affects opportunities for technological innovation.

Workload: This course is assigned 3 credits and runs on 3 hour-per-week schedule over a 13-week semester, with readings. Each student registering for the course must be prepared to commit the required time.

Course content and organization of sessions

#	DATE	TOPIC	CASE STUDY / READING / ACTIVITY
1	Jan. 5th	Course introduction	
	1. The Sustainability of IT		
2	Jan. 12th	Waste not: How green is IT?	• Case study: Host Europe: Advancing CSR and sustainability in a medium-sized IT company (Ivey: 8B10M42) –

#	DATE	TOPIC	CASE STUDY / READING / ACTIVITY
			pages 1-7 + exhibits pp. 14-17 • *Introduction to term project*
3	Jan. 19th.	Greening of IT	• Case study: Host Europe: Advancing CSR and sustainability in a medium-sized IT company (Ivey: 8B10M42) – Pages 8-14 + exhibits pp. 14-17
	2. Innovation and Sustainability		
4	Jan. 26th	Technology Life Cycle	• Reading: Global Sustainability and the Creative Destruction of Industries; Disruptive Innovation – In Need for a better Theory
5	Feb, 2nd	Strategic approaches to sustainable innovation	• Reading: Technological discontinuities and the Swiss watch industry; Winning in the Green Frenzy; When does it pay to be green? • Case study: Betterplace Shifting Paradigms in the Automotive Industry
6	Feb. 9th	Sociological and systems thinking approaches to sustainable innovation	• Reading: Innovating our Way to the Next Industrial Revolution; The social Construction of 'Green Building' in the Swedish Context; How IT can cut carbon emissions • Case: In-Class Handouts • *Take home assignment out*
	3. IT for Sustainability		
7	Feb. 16th	Informing for Sustainability	• Reading: CDP: the facts + preparatory work for session: registering and looking at https://www.cdp.net/en-US/Results/Pages/academic-data.aspx and data • *Take home assignment due*
8	Feb. 23rd	Greening through IT	• Case study: Greenpeace's Unfriend Coal campaign and Facebook (Ivey 8B12M011) + Revisit Host Europe

#	DATE	TOPIC	CASE STUDY / READING / ACTIVITY
			• *Mid-term exam prep*
9	Mar. 9th	*Midterm exam*	
	4. Technology and Innovation for Sustainability – Integrated sessions		
10	March 16th	Building a sustainable future with IT	• Case study: Greenpeace's Unfriend Coal campaign and Facebook (Ivey 8B12M011) • *Term project poster session*
11	Mar. 23rd	Achieving sustainability through technological innovation	• Reading: How Technology Could Contribute to a Sustainable World; Innovating in Uncertain Markets: 10 Lessons for Green Technologies; Smart Cities and the Energy Cloud • Case study: Velib (*compare & contrast with Betterplace)*
12	Mar. 30th	Simulation: Challenges of growing your sustainability business & Course Wrap-up	• Reading: Misguided Policy? Following Venture Capital into Clean Technology • Simulation Prep: View Instruction Video
13	Apr. 13th	*Term projects presentations*	

Note: This session-by-session schedule is tentative and subject to change due to the uncertainty with the number of group presentations and unpredictable contingencies. It is your responsibility to get informed about possible schedule changes from myCourses.

Learning methods

A variety of instructional approaches will be used during the course, including:

- Lectures
- Case studies
- In-class and virtual assignments
- Interactive in-class discussions
- In-class applications and team work
- In-class simulation
- Group project

Course materials

- Lecture notes will be made available through MyCourses after the lectures. Students are required to read all materials posted on the CMS.
- A coursepack containing all case studies is available for purchase from Dave's.
- Session readings are posted on MyCourses.

Assignments and evaluations

Component	**%**
Participation (individual)	10%
Take Home Assignment (individual)	15%
Midterm exam (individual)	35%
Term project (group)	40%

Participation

Considering the interactive nature of the class sessions, class participation is an important part of the learning experience in this course. High emphasis will therefore be placed in-class discussions, including of case studies. Beyond attendance, participation takes in consideration active participation and professionalism. Please make every effort to attend all sessions.

Take Home Assignment

Midway the course students will complete a take home assignment. The assignment is due one week after handed out. The assignment provides an opportunity for students to apply in more depth some of the analytical tools and concepts presented during the first part of the semester. In addition, by doing some basic research students will be able to develop deeper knowledge in a topic selected from a list of options.

Mid-term examination

During the semester, students will complete a comprehensive exam that will test their knowledge and understanding of the concepts and ideas introduced in the course. The

exam will also test students' ability to apply, practically, some of the key tools and instruments presented during the semester.

Term Project

Self-selected groups of three to four students will work on the term project that will consist in creating a "Technology and Innovation for Sustainability" case study. At the end of the semester, each group presents their project in class and submits a written report. More details about this assessment methods will be given in due time.

Course Policies and Norms

Class Behavior

- It is strongly suggested that you limit your absences. You are responsible for:
  - Everything that is covered in class
  - Materials in the notes and reading material posted/assigned on the CMS
  - Course handouts
- Disruptive behavior will lower your class participation marks.
- Please make yourself aware of the Desautels Faculty of Management policy posted in the classroom, aimed to further encourage a respectful and professional atmosphere in and around the classroom.

Academic Integrity

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/integrity for more information).

For more information of academic integrity, see the following book:

> Lipson, C. *Doing honest work in college: how to prepare citations, avoid plagiarism, and achieve academic success*, Chicago, 2004.
>
> This book is available on Reserve in the library at call number PN171 F56 L56 2004.

Assignments

- Assignments may be written in either English or French.
- All assignments and exams must include your name, student number and section number.

- You are solely responsible for handing in your assignments/papers on time. Grade penalties will be given for lateness. Always make sure you have a backup of your assignments. Students should inform the instructor as early as possible, should any delay in handing in assignments happen for legitimate reasons.

Course changes

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.