Innovation and Technology

Instructor: Professor Gregory Tangonan, School of Science and Engineering
1st Semester SY 2012-2013

Course Description
Though technology plays a very important role in our lives, we seldom reflect on how a technological breakthrough happens, or even on how it actually happened. This course is aimed at future technologists and innovators, the focus is on developing a strategic understanding about the process of bringing new technologies to market, creating a technology driven business in a highly competitive environment, and, probably most importantly the role of Innovators in creating a globally competitive Philippines.

We address questions like: what makes an innovation really ‘hot’, how were new technologies developed, what makes a technology start-up a business success, and how do successful technologies lead to whole new industries, and how did the Innovators protect and capitalize on their great ideas? This course surveys themes like technology and society, creation of new technology companies based on new ideas, and global competitiveness. We will need to understand the technical basis of new developments but our objective is to understand the global context of technology development as well.

This course builds on the students’ awareness of market acceptability of new Innovations and develops their understanding of competition of IT driven companies like Apple, Facebook, Amazon, Google, Microsoft. Who will survive the intense competition in the era of social networking? Who will win the battle of Cloud Computing services and the next generation Television? In addition we will review top Innovation trends in the fields of the environment, energy, and health and wellness, with an eye to deciding where Filipino Innovators can have major impact on emerging markets. What does the market for electric vehicles look like in the Philippines? Why is telemedicine a game changer for the country?

Being aimed for future technologists at the start of their careers, the class emphasis classroom participation, lively presentations on new e-commerce business plans, and in depth analysis of Innovation cases in fields from energy to drug development. The instructor or guest speaker will oftentimes just
catalyze student discussion. This class could make learning and investigating new ideas, summarizing new ideas, and judging the potential impact, an integral part of their lifelong learning.

The competitive landscape is changing rapidly, today focused R&D and product development teams in developing companies can compete globally. The origins of the “flattening” of the competitive environment will be a major focus of the class lectures and student presentations. Our efforts will be to understand how these forces affect the Philippines. We will study the strategic role that intellectual property – patenting, licensing, and trade secrets – plays in securing for entrepreneurs their intellectual equity.

Specifically in the first semester the topics surveyed will be the Top iPhone Apps of 2012, Novel Business Plans Review, Top Inventions of 2012 and Intellectual Property Wars of 2012-13. Students will be required to present their understanding of these issues individually during the semester.

Course Objectives
The course will develop skills in strategic thinking about technology and society. The course will hone student’s presentation skills, especially in making concise and insightful presentations on technical topics. This course will develop the skills of independent information gathering, analysis, and critical thinking on innovations that will prove very useful in your future careers.

The students presentations will analyze a particular innovation and break down its significance: What is the technology behind this invention, is this going to be a big deal that command a huge market, and can we figure out how to apply this idea to other fields, can we develop a better, more powerful idea that will take it to new markets? The presentation ought to be concise (4 charts/4 minutes), with polished and practiced dialogue and ready to answer questions that will come from the floor.

Because it is now a highly topical issue, the class will analyze new trends like the Future of
Television. An exciting exercise we will do is to anticipate Apple new Television technology by asking: what would you like Apple TV to be?

We will examine the competitive landscape from the parallel track of Patenting. We will ask: how do companies actually ‘own’ ideas and prevents others from copying their Inventions. Here students will do patent searches of the portfolios of different companies participating in these fields.

The class reading of major new books on Innovation has become a tradition in this class. Given the strong focus on Innovation and Technology, we will probably do a class reading of the really exciting new book, ‘Where Good Ideas Come From, The Natural History of Innovation’ (Riverhead Books 2010). This will serve as a working text for the course, in addition to the extensive library of books we have on Innovation in the Ateneo Innovation Center. Student teams will present 20 minute presentations on the different Chapters of this book. We can reflect on how the Innovations already studied evolved, using Johnson’s analysis of Innovation.

The biography of Steve Jobs by Walter Isaacson (2011 Simon and Schuster) will be the other class reading for the semester. This book provides a three dimensional view into one of this generation greatest innovators.

Given that some students will also be finding thesis topics for their undergraduate research in materials science, we for them we will tackle questions like: What can be the impact of my research? Can I position my work close to the state of the art in technology by focusing on fertile areas for Innovation? Is industry already interested in this topics area? This exercise can really help crystallize their motivation for doing good research in terms of future Innovation of their findings.
Prerequisites: Since many Innovations are aimed at a very broad market, we encourage students from all majors to take this class. No strong technology background is required to enjoy the latest iPad and iPhone, so why should only techies develop an understanding of how Innovation happens? Since techies and non-techies make up the market for world class Innovation, this class encourages an Open Innovation environment where the students work together to conceptualize great new business ideas based on high technology.

Readings, Information sources, and Seminars:
A library of books is available for students in the Ateneo Innovation Center, a listing of the books is given below for the First Semester class. Original magazines and materials downloaded from the Faculty’s own subscriptions to variety of sources will be made available to the students. These materials have been obtained from sources like the *The Economist, Scientific American, Wired, Business Week, Technology Review Magazine, IEEE Spectrum,*, and the *Wall Street Journal*. Extensive use of Podcast materials on Innovation are also available, notably Stanford University, MIT, and TED Talks have lectures that students can learn from. Students are encouraged to listen to several Innovation Podcast on the Web in developing their class presentations and developing their applications.

Course Requirements
Meeting deadlines for presentation is of great importance in evaluating student performance. Students are required to make four major presentations to the class and to participate in meaningful class discussions of presentations. In most cases, the presentations and proposals are Power Point slides (5 charts max – 5 minutes max). Not meeting deadlines will result in a significant lowering of the high grade that students start with. The grading scheme is based on class presentations, class participation and reaction papers. Book presentations will be typically 20 minutes with 10 charts, students must schedule their presentations. All presentations will be uploaded to the class website to be considered complete (except those hot ideas we want to work on more).
Innovation and Technology Bibliography

Books

Steve Jobs by Walter Isaacson (2011 Simon and Schuster)
Little Bets - How Breakthrough Ideas emerge from Small Discoveries by Peter Sims (2011 Free Press)
A History of Silicon Valley: the Greatest Creation of Wealth in the History of the Planet by Arun Rao and Piero Scauffi (2011 PerfectPaperback)
Where Great Ideas Come From by Steven Johnson (2010 Riverhead)
Physics for Future Presidents by R. Muller (2008 Norton)
Made by Hand by M. Frauenfelder (Portfolio 2010)
The Accidental Billionaire by B. Mezrich (First Anchor 2009)
The Steve Jobs Way by J. Elliot (Vanguard 2011)
Linchpin - Are you Indispensable by Seth Godin (2010 Penguin Group)
Hot, Flat and Crowded by Thomas Friedman (2008 Farrar, Strauss,Giroux)
Groundswell by Charlene Li and Josh Bernoff (2008 Harvard Business Press)
Wikinomics- How Mass Collaboration Changes Everything by Don Tapscott and Anthony Williams (2008 Portfolio)
Founders at Work:Stories of Startups' Early Days by Jessica Livingston (2007 Apress)
The Inventor's Dilemma by Clayton M. Christensen (2002 Harper Collins)
The Inventor’s Solution: Creating and Sustaining Successful Growth by Clayton M. Christensen and Michael E. Raynor (2003 Harvard Business School Publishing)
Crossing the Chasm by Geoffrey A. Moore (2002 Harper Collins)
The World is Flat by Thomas Friedman (2006 Farrar, Straus and Giroux; Updated Edition)
The Flight of the Creative Class by Richard Florida (2005 Harper Collins)
The Cult of the iPod by Leander Kahney (2005 No Starch Press)
The Tipping Point by Malcolm Gladwell (2002 Little Brown and Company)
What Would Google Do ? by Jeff Jarvis (2009 Collins Business)
The Google Story by David Vise and Mark Malseed (2006 Delta)
The Longer Long Tail by Chris Anderson (2008 Hyperion)
Free by Chris Anderson (2009 Hyperion)
The Talent Code by Daniel Coyle (2009 Bantam)
In Pursuit of Elegance by Matthew May (2009 Broadway Books)
Outliers by Malcolm Gladwell (2008 Little Brown and Company)
Inside Steve's Brain by Leander Kahney (2009 Portfolio)
**Change by Design**  by Tim Brown (2009 Harper Collins)

**Newspapers and Magazines**  
**Business Information Sources**  
Technology Quarterly from the Economist Magazine (2007 to 2008)  

**Technical Journals**  
IEEE Spectrum, Scientific American  
American Scientist, MIT Technology Review  
Physics Today, EE Times