



Instructor: Professor Gregory Tangonan
School of Science and Engineering
1st Semester SY 2013-2014

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 is Technology based Innovation and How does it happen?
- What is the most conducive environment for Innovation and Innovators?
- What makes Innovation Disruptive, Evolutionary and Inclusive?
- Where do Great Ideas come from? How does it make for Great Companies?
- How can the Philippines become a competitive player in Global Innovation?
- How deep and broad a technical background do modern Innovators need?
- How does one get started in Innovation and Research?

This course builds on the students' awareness of market acceptability of Innovations and develops their understanding of competition of ICT-driven Innovators 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?

With several students doing undergraduate research in science and engineering, students will describe the Innovations coming to market as seen in IEEE Spectrum and The Economist Quarterly. Students will focus will be on technology driven Innovations that are coming to market, explaining the basis and potential for these state-of-the-art innovations. They may be able to craft an innovation plan that leverages these ideas into the Philippines' S&T Innovation Agenda.



Professor Tangonan with lecture on several topics this semester and Students will be present their work in cogent presentations. Here is the list of topics and assignments for this Semester.

State of the Art Innovations

Models of Innovation - Linear and Nonlinear, Tech Push or Pull
Changing the Way We Innovate
Assignment 1. IEEE Spectrum
Assignment 2. The Economist Quarterly

Intellectual Property

The Power of 'Owning' a Great Idea
Prior Art Searching
Patent Gap Analysis for Innovators
Assignment 3. Breakdown of IP for Innovations from Assignment 1 & 2

Innovations in Education and Social Media

Apple - Google - Facebook - Amazon - Who will Win?
MOOC - Massive Open Online Courses
Mega Trend for Lifelong Learners and Empowering Students Worldwide
Assignment 4. AGFA Team Presentations - Who will Win?
Assignment 5. Course Enrollment and Personal Evaluation

Innovations on Campus and from Industry Partners

Class Presentations from Ateneo Innovators and Industry Partners

Assignment 6. Competitiveness and IP Analysis of Ateneo Research Topics
Assignment 7. Reaction Paper to Industry Speaker

Readings in ICT Applications for Medical Informatics

ICT as Crucial for Developing new Medical Informatics Businesses
Assignment 8. Class Readings and Presentations on Medical Informatics
Where Good Ideas Come From by Johnson (Penguin 2010)
Big Data - A Revolution that will Transform the World by Schonberger and Cukier (Houghton Mifflin 2013)
The New Digital Age - Schmidt and Cohen (Knopf 2013)



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 student presentations will analyze a particular innovation and break down its significance: What is 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.

Given that SOSE students will be finding thesis topics for their undergraduate research in physics, engineering and materials science, 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 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. But the students should be prepared to learn some science in this class.

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. Student presentations will be considered complete after being uploaded to the class website (except those **really hot ideas** we want to develop more).

Readings, Information sources, and Seminars:

A library of Innovation related 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 like BBC Click in developing their class presentations and developing their applications.

Innovation and Technology Bibliography

Letters to a Young Scientist by Wilson (Liveright 2013)
Big Data - A Revolution that will Transform the World by Schonberger and Cukier (Houghton Mifflin 2013)
The New Digital Age - by Schmidt and Cohen (Knopf 2013)
Steve Jobs by Walter Isaacson (Simon and Schuster 2011)
Piracy - The Intellectual Property Wars from Gutenberg to Gates - Jones (University Chicago 2009)
The Physics of Wall Street - A Brief History of Predicting the Unpredictable by Weatherall (Houghton Mifflin Harcourt 2013)
Linked - How Everything is Connected by Barabasi (Plume 2003)
Managing Innovation by Todd and Bessant ((Wiley 2009)
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)
The Game Changer by A.G. Lafley and Ram Charan (2008 Crown Business)



The Medici Effect by Frans Johansson (2006 Harvard Press)
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)
The Post American World by Fareed Zakariah (2008 Norton)
Founders at Work: Stories of Startups' Early Days by Jessica Livingston (2007 Apress)
The Black Swan: The Impact of the Highly Improbable by Nassim Taleb (2007 Random House)
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)
How Breakthroughs Happen: the Surprising Truth about How Companies Innovate by Andrew Hargadon (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 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
 Wall Street Journal Online, Time, Business Week, Atlantic Monthly

Technical Journals

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