

The Wharton School, University of Pennsylvania
MGMT 235 – Technological Innovation and Entrepreneurship

Fall 2016

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I. OVERVIEW AND PROCEDURES

This course will give you an overview of entrepreneurial development, especially within the realm of technical innovation. We will be concerned with content and process questions as well as with formulation and implementation issues that relate to conceptualizing, developing and managing successful new ventures.

The emphasis in this course is on applying and synthesizing concepts and techniques from the functional areas of strategic management, finance, managerial economics, marketing, operations management, and organizations in the context of new venture development. The class serves as both a stand-alone one and as a preparatory course to a more in-depth venture implementation class (MGMT 231).

MGMT 235 will appeal to individuals who have a desire to become entrepreneurs at some stage of their career. Similarly, students who intend to work in the entrepreneurial ecosystem (such as in the venture capital industry) will benefit from the course.

You are expected to come to class well prepared to discuss the reading materials, as I will run the class in a seminar-like format. Required readings are found in the bulk packet which should be distributed to you electronically. Class attendance and active class participation are essential to the learning goals in this course. I have found that laptop/tablet/smartphone use distracts from the learning experience in class, and so ask that you refrain from using your communications devices when class is in session. To ensure that the class is highly interactive, I ask that you bring your name card to each and every class meeting. I will actively use the class website to post notes and manage the class, and I do not expect any paper to change hands in the course.

II. DELIVERABLES: PRESENTATIONS AND TERM PROJECT SUBMISSIONS

You will make two presentations and submit a group business plan in this class. For the first presentation (9/22 and 9/27), you will form teams of 2 or 3 (I will specify more details after the final enrollments are in) and give an overview of an emerging technology (the below list contains pre-approved topics; if you wish to pursue a different one, let me know), together with thoughts about entrepreneurial opportunities within that technology area. More details will be provided in class. Pre-approved topics for the first presentation: 3D printing; Artificial intelligence and machine learning; Big data and data analytics; Clean tech; Cloud computing; Crypto-currency; Driverless cars; Gene editing (CRISPR) technology; Immunotherapy; Nanotechnology; Precision medicine; Virtual reality.

A final group business plan and associated presentation is required. Please form teams of approximately 3 people, and the final submission will be approximately 25 pages, which will mirror the functional areas covered in the reading on “Developing Business Plans and Pitching Opportunities”. Please make use of the “discussion” section

of Canvas to facilitate team formation. More details will be provided in class. The due date for the plan, together with your team's presentation/pitch is on 12/6 at 1:30pm uploaded to Canvas.

The interim submission date (October 13 by 5pm), uploaded to the appropriate Canvas folder). This submission is a 2-3 page statement of the topic of your term project/mini business plan, as well as a possible outline of your paper (or any other information you think will be helpful to communicate to me regarding the aims and scope of your project). We regard this submission as a binding statement of your term project. Please make sure that names of all team members are on the submission.

While you are probably aware of the conventions of properly citing material and ideas, I believe a short note on the subject is worthwhile. Material reproduced verbatim should be enclosed in quotation marks, with proper attribution made to the source. Ideas and concepts even if not quoted verbatim should be attributed to the author/source, also via proper citation.

III. COURSE ADMINISTRATION

- I will hold office hours by individual appointment (just email me with some possible times).
- I will manage the class through the Canvas platform (including posting slides and email alerts), so please be on the lookout on the course platform.
- The course teaching assistant is Alex Sands, sandsa@wharton.upenn.edu.

IV. COURSE GRADING

- 33% active class participation
- 5% team technology briefing presentation (slides due 9/27 at 1:30pm for *all* teams)
- 5% 2-3 page team submission of venture topic & preliminary outline (due 10/13 at 5pm)
- 50% term paper/ business plan slide deck (due 12/6 at 1:30pm for *all* teams)
- 7% two-three page individual written feedback on another team's term paper/mini business plan (due 12/13 at 1:30pm for everyone)

V. INSTRUCTOR BIOGRAPHY

David Hsu is the Richard A. Sapp Professor of Management at the Wharton School, University of Pennsylvania. He holds degrees from Stanford, Harvard, and MIT. Hsu's research interests are in entrepreneurial innovation and management. Within that domain, he has investigated topics such as intellectual property management, start-up innovation, technology commercialization strategy, and venture capital financing. At Wharton, he teaches in the in the domains of Entrepreneurship, Innovation and Strategy across the full range of degree programs. At Penn, Hsu is Associate Faculty Director of the *Weiss Tech House*, and is co-founder of the annual Y-Prize competition.

Overview of MGMT 235: Technological Innovation and Entrepreneurship

Session	Date	Topic
1	8/30	Class introduction and team building; sign up for emerging technologies and entrepreneurial opportunities
2	9/1	Creating value from innovation
3	9/6	Capturing value from innovation
4	9/8	Venture ideation and mini Y-prize
5	9/13	Developing business plans & GUEST SPEAKER PANEL TBA (Startup panel)
	9/15 & 9/20	No class: work on research for your technology and entrepreneurship briefing and your interim business plan submission/proposal
6	9/22	Technology and entrepreneurship briefing 1 (student presentations)
7	9/27	Technology and entrepreneurship briefing 2 (student presentations)
8	9/29	Geography of innovation
9	10/4	GUEST SPEAKER PANEL TBA (Growth challenges panel)
	10/6	No class (Fall Break)
10	10/11	Judo strategy
11	10/13	Value chain strategy; <i>NOTE: statement of business plan topic due at 5pm today</i>
12	10/18	Disruption and blue ocean strategy
13	10/20	Team meetings with the instructor to discuss interim submission
14	10/25	Entrepreneurial experimentation
15	10/27	Financing innovation 1
16	11/1	Financing innovation 2 & GUEST SPEAKER PANEL TBA (Investing panel)
17	11/3	Entrepreneurial growth
18	11/8	Expansion and scaling
19	11/10	Harvesting
20	11/15	GUEST SPEAKER PANEL TBA (Careers in E&I)
21	11/29	Team meetings with the instructor to discuss term project
	12/1	No class: work on your term projects and presentations
22	12/6	Final presentations; <i>NOTE: business plans for all teams due at 1:30pm today</i>
23	12/8	Final presentations; <i>NOTE: comments on assigned peer plan due on 12/13 at 1:30pm</i>

Mgmt 235: Technological Innovation and Entrepreneurship

Session 1: 8/30

Introduction & Course Overview; Issues in Team Building

Read:

- “A Special Report on Entrepreneurship,” *The Economist*, March 14, 2009.
- “Attracting Talent and Building Ecosystems” Harvard Business School note, (HBS product number 8068-HTM-ENG).
- Optional: D.H. Hsu (2008). “Technology-Based Entrepreneurship,” in S. Shane, ed., Handbook of Technology and Innovation Management, Wiley, UK.

Study questions: What characteristics would you look for in assembling your ideal new venture team? Why?

Session 2: 9/1

Creating Value from Innovation

Read:

- R. Foster (1996), “The S-Curve: A New Forecasting Tool,” Innovation: The Attacker’s Advantage, Summit Books, Simon and Schuster: NY, Chapter 4, pp. 88-111.
- D. Teece (2010). “Business Models, Business Strategy and Innovation,” *Long Range Planning*, 43: 172-194.
- Optional: G. Moore (1999) “Crossing the Chasm,” Harper Business Press, Chapters 1 and 2.

Study question: What are technical and non-technical reasons for the shape of the S-curve? How does business model design interact with the S-curve framework?

Session 3: 9/6

Capturing Value from Innovation

Read:

- D. Teece (2000), “Market Entry Strategies for Innovators: Avoiding Pyrrhic Victories,” in Managing Intellectual Capital, Oxford University Press, pp. 91-113.
- “A Market for Ideas: A Survey of Intellectual Property Protection,” October 22, 2005, *The Economist*. **Read pp. 3-12, skim the rest.**
- Optional:
 - J. Gans and S. Stern, “The Product Market and the Market for Ideas: Commercialization Strategies for Technology Entrepreneurs,” *Research Policy*, 2003.
 - D.H. Hsu and R. Ziedonis, “Resources as Dual Sources of Advantage: Implications for Valuing Entrepreneurial-Firm Patents,” *Strategic Management Journal*, 34: 761-781, 2013.

Study questions: What are the main channels Teece suggests can be used to appropriate value from innovation? Are there special challenges associated with those channels for startups?

Session 4: 9/8

Venture Ideation and Mini Y-Prize

Read:

- “Good Ideas and How to Generate Them” from B. Nalebuff and I. Ayres, Why Not?, Harvard Business School Press, Boston, 2003, pp. 13-42
- Optional: K. Girotra, C. Terwiesch, and K. Ulrich (2010), “Idea Generation and the Quality of the Best Idea,” *Management Science*, 56(4): 591-605.

Study question: What are the main ways Nalebuff and Ayres suggest you can generate good ideas for ventures? What are the pros and cons of each?

After understanding the core concepts, we will conduct a significant in-class exercise related to venture ideation. Come prepared to actively engage.

Session 5: 9/13

Developing Business Plans & Guest Speaker TBA

Read:

- Developing Business Plans and Pitching Opportunities, Harvard Business School Note, HBS Product number 8062-HTM-ENG.

Guest speaker details TBA.

Sessions 6-7: 9/22 and 9/27

Student Presentations on Technology and Entrepreneurship (two sessions)

Each team will give an overview of an interesting technology segment, together with analysis on potential entrepreneurial opportunities arising from the focal technology.

Session 8: 9/29

Geography of Innovation

Read:

- M. Porter and S. Stern (2001). “Innovation: Location Matters,” *Sloan Management Review*, 42: 28-36.
- “Location Choice for New Ventures: Cities” Harvard Business School Note 9-811-106.

Study Question: what are the leading theories as to why innovation often occurs in geographic clusters? how might you design a study to test the comparative salience of the theories? What are the implications for how you think about the tradeoffs for startup location decisions?

Session 9: 10/4

Guest Speaker Panel (Growth Challenges) TBA

Guest speaker details TBA.

Session 10: 10/11

Judo Strategy

Read:

- “Mastering Balance: How to Meet and Beat a Stronger Opponent” by D. Yoffie and M. Kwak, *California Management Review*, Winter 2002, pp. 8-24.
- Case: Judo in Action (HBS Case 9-703-454).

Study question: How can new ventures compete against established firms, which have both more resources and an established reputation?

Session 11: 10/13

Value Chain Strategy

Read:

- P. Milgrom and J. Roberts. 1992. Economics, Organization, and Management, pp. 28-33.
- FreshTec: Revolutionizing Fresh Produce (HBS Case 9-511-059)

Study questions: As FreshTec, what is your preferred entry strategy? Why? To what extent does your analysis of transaction costs factor into your preferred entry strategy?

Please upload to Canvas your team’s statement of business plan topic by today at 5pm.

Session 12: 10/18

Disruption and Blue Ocean Strategy

Read:

- CM. Christensen and JL. Bower. 1995. Bower and Christensen, “Disruptive Technologies: Catching the Wave,” *Harvard Business Review*, January-February.
- W.C. Kim and R. Mauborgne, “Blue Ocean Strategy: From Theory to Practice,” *California Management Review*, Spring, Vol. 47, No. 3: 105-121.

Study questions: What are the main benefits and challenges for new ventures in adopting a disruption strategy? Without coordinating with colleagues, please come to class with at least one example of a successful or failed new venture disruption strategy along with your speculation as to the root cause for the outcome. What are some of the main challenges associated with a blue ocean strategy?

Session 13: 10/20

Team meeting with the instructor to discuss term project proposal

Details TBA, but we will not meet as a class; instead you will schedule a meeting with the instructor to discuss your project in office hours.

Session 14: 10/25

Entrepreneurial Experimentation

Read:

- “Experimenting in the Entrepreneurial Venture” Harvard Business School note (HBS product number 8077-HTM-ENG).
- Optional: M. Marx and D.H. Hsu (2015). “Strategic switchbacks: Dynamic commercialization strategies for technology entrepreneurs,” *Research Policy*, 44: 1815-1826.

Study question: what are the pros and cons of entrepreneurial experimentation (at all), and of various degrees of experimentation?

After understanding the core concepts in the readings, we will conduct in-class team-based exercises practicing the lean startup method. Come prepared to actively engage in these exercises.

Session 15: 10/27

Financing New Ventures (1)

Read:

- Andreessen Horowitz (HBS Case 9-814-060).
- “Financing Entrepreneurial Ventures,” Harvard Business School note (HBS product number 8072-HTM-ENG).
- Optional: D.H. Hsu (2004). “What do entrepreneurs pay for venture capital affiliation?” *Journal of Finance*, 59: 1805-1844.

Study questions: What allowed Andreessen Horowitz to successfully enter the venture capital industry in the face of unfavorable industry conditions? What is the economic function of the key institutional features that venture capitalists often employ?

Session 16: 11/1

Financing New Ventures (2)

Guest Speaker panel, TBA

Session 17: 11/3

Entrepreneurial Growth

Read: Back Bay Battery, Inc. simulation – Foreground note for online simulation, Harvard Business Publishing.

Advance preparation: please familiarize yourself with the online interface, as we will form teams in class and undertake the simulation and debrief afterwards. Please read the Foreground reading prior to class.

Session 18: 11/8

Expansion and Scaling

Read:

- “Google Car” HBS case 9-614-022.
- Skim: P. Ghemawat and J. Rivkin. 2010. “Choosing Corporate Scope,” *Strategy and the Business Landscape* (3rd ed.), Ch. 6, pp. 123-147.

Optional:

- Astro Teller of GoogleX: TED talk

Study Question: Build the case for and against investing in Google car.

Note: We will be simulating an executive meeting on the Google car. Come prepared to possibly role play both the perspective for and against the driverless car project. I will randomly assign representatives to engage in the role play during class.

Session 19: 11/10

Harvesting

Read: “RightNow Technologies” HBS Case 9-805-032

Optional: V.A. Aggarwal and D.H. Hsu “Entrepreneurial Exits and Innovation,” *Management Science*, 60: 867-887.

Study Question: What are the main tradeoffs associated with choosing an entrepreneurial liquidity mode?

Session 20: 11/15

Careers in Entrepreneurship and Innovation (Guest Speaker Panel)

Details TBA.

Session 21: 11/29

Team meeting with the instructor to discuss term project

Details TBA, but we will not meet as a class; instead you will schedule a meeting with the instructor to discuss your project in office hours.

Sessions 22 & 23:

Presentations and Pitches

Details TBA.

Final papers (for all teams) are due December 6 at 1:30pm – uploaded to the website (no paper copy needed). *LATE PAPERS WILL NOT BE ACCEPTED!*

Individual written comments on another team’s term project (assigned to you) due December 13 at 1:30pm (comments will be shared with your colleagues!)