Course Overview

This course examines the technical and managerial challenges presented by emerging and evolving technologies. Particular consideration is given to the forces affecting the nature and rate of technological innovation and the managerial options available to both established and entrepreneurial organizations. In doing so, we explore both internal and external sources of innovation as well as the appropriate strategies and processes for capitalizing on them.

Time:       Monday/Wednesday 1:30-3:00 p.m.
Place:      107 SHDH
Instructor: Prof. Saikat Chaudhuri
            3463 SHDH; saikatc@wharton.upenn.edu; 215-898-6387
Office Hours: Monday 4:30-6:30 p.m. (or by appointment)
Course Assistants: M. Grenader, A. Nadgauda, N. Narain, Z. Stiles, B. Zeoli
Canvas Web Page: https://canvas.upenn.edu/courses/1387284

Course Requirements

The course will be taught in seminar fashion with substantial class discussion. Thorough preparation and active class participation and attendance are essential. Assigned and supplementary readings will be augmented by cases and occasional guest lectures. Students will prepare a variety of written assignments, including case analyses and two research papers dealing with selected technologies, firms and industries. Research topics will be selected by students with instructor approval. The final course grade will be based on: (a) case analyses, annotated bibliographies, and the course concepts and perspectives assignment (30%); (b) research papers and presentations (45%); and (c) class participation (25%).

Course Materials


Bulk Pack (BP): Assigned Articles and Cases on Study.Net

Canvas (C): Assigned Articles, Cases, and Videos on Canvas

Library Websites: http://guides.library.upenn.edu/mgmt237 (General Resources)  
http://gethelp.library.upenn.edu/PORT/ (Research Guidelines)
I will be expecting a lot from each of you in this course, just as you should be expecting a lot from me. Together we can make this a very positive and valuable excursion into the intersection of Management and Technology. Toward that end, please review and observe the following:

1. Be on time and well prepared.

2. Participate actively and constructively in class discussions – whether offering observations, answering questions or challenging other’s positions (including mine!). You may find this to be a challenge in a large class and this will be more difficult for some than for others.

3. Bring your name card to every session to help ensure that the class is highly interactive.

4. Do not open your laptops when class is in session – I have found that computer use distracts from the learning experience and active interaction during class.

5. Pay careful attention to what is going on in each class and be alert to opportunities to participate. This includes not only what is being presented from the front, but also what your classmates are contributing.

6. Eating food is absolutely forbidden once each class session begins. I realize that this may impose some hardship on those of you whose schedules preclude a lunch period. The only exception is if you bring enough for everyone! Water and other drinks are permitted.

7. In the rare event that you are forced to miss a class, be sure to alert me IN ADVANCE by email with an explanation. It will be your responsibility to obtain class notes and/or handouts from your classmates and/or the M&T office. Only in exceptional circumstances will make-ups be arranged for missed unannounced quizzes.

8. Written assignments are due on the date indicated unless prior approval has been granted. Late assignments will receive a minimum of a one grade reduction.

9. All written assignments in this course are to be your individual work – unless explicitly indicated otherwise. And, while most of you are aware of the accepted conventions for citing material and ideas, this has occasionally posed problems in the past. Anything reproduced verbatim should be indicated by quotation marks with the source appropriately cited. Anything drawn from others but not quoted verbatim, such as ideas or concepts, must also be appropriately cited. See \texttt{http://gethelp.library.upenn.edu/PORT/} and/or consult the Lippincott Library staff for further guidance if needed.
I. UNDERSTANDING TECHNOLOGICAL INNOVATION

1. WE 1/10  THE NATURE OF TECHNOLOGICAL INNOVATION
   Introduction (Skim)  T: 1
   Sources of Innovation (Skim)  T: 2
   Innovation in Industry (Skim)  BP: 1
   Out of the Dusty Labs (Skim)  BP: 2
   This Way to the Future (Skim)  C: 1
   The Unexpected Science to Come (Skim)  C: 2
   10 Breakthrough Technologies 2017 (Skim)  C: 3
   Century of the Sciences (Skim)  C: 4

   MO 1/15  Martin Luther King, Jr. Day (No Class)

2. WE 1/17  THE STRATEGIC IMPACT OF TECHNOLOGICAL CHANGE
   Avoiding Innovation's Terrible Toll (Skim)  C: 5
   Types and Patterns of Innovation  T: 3
   Why Good Companies Go Bad (Skim)  C: 6
   Timing of Entry  T: 5
   Technological Innovation in the Photographic Industry (Skim)  BP: 3
   Outside the Box (Skim)  C: 7

3. MO 1/22  INNOVATION PATTERNS AND EMERGING VS. ESTABLISHED TECHNOLOGIES
   Patterns of Industrial Innovation  BP: 4
   The Dynamics of Technology and Strategy (Skim)  BP: 5
   Timex Corporation (A) and (B)  BP: 6, 7

4. WE 1/24  TECHNOLOGICAL INNOVATION AND STRATEGIC MANAGEMENT
   Defining the Organization’s Strategic Direction  T: 6
   Technology Leadership Can Pay Off  BP: 8
   Technology and Competitive Advantage: The Role of General Management  BP: 9
   Managing Technology as a Strategic Asset  C: 8

5. MO 1/29  WINDOW ON TECHNOLOGICAL INNOVATION  RP #1 Proposal
   Guest Resource: Justin Reilly, Head of Customer Experience Innovation, Verizon

6. WE 1/31  PERSPECTIVES ON EMERGING TECHNOLOGY  AB #1
II. MANAGING TECHNOLOGICAL INNOVATION AND NEW PRODUCT DEVELOPMENT

7. MO 2/05  TECHNOLOGY AND COMPETITIVE ADVANTAGE
Standards Battles and Design Dominance (Skim) T: 4
The Art of Standards Wars C: 13
Battle for Autonomous Driving “Sight”: LIDAR vs. RADAR Sensing (Self-research)

8. WE 2/07  GLOBAL TECHNOLOGY AND INNOVATION
Strategies for Global R&D BP: 10
Technology Map of the World BP: 11
Toyota and Sony: R&D Alone Is Not Enough BP: 12
India and China Wise Up to Innovation BP: 13
Revving Up C: 14
Growing Through Innovation C: 15

9. MO 2/12  MANAGING TECHNOLOGY STRATEGIES AND THE INNOVATION PROCESS
Choosing Innovation Projects T: 7
Managing Real Options (Skim) BP: 14
Managing the New Product Development Process T: 11
Developing Products on Internet Time BP: 15
Silicon Valley Specialists BP: 16

10. WE 2/14 LESSONS FROM INNOVATIVE FIRMS
Masters of Innovation: How 3M Keeps Its New Products Coming BP: 17
GE Sees the Light BP: 18
Built for Innovation BP: 19
Putting the “I” into HP BP: 20
3M’s Innovation Crisis C: 16
The World’s Most Innovative Companies 2017 C: 17
Lessons from Apple C: 18
Radical Collaboration: Lessons from IBM’s Innovation Factory C: 19

11. MO 2/19 TECHNOLOGICAL INNOVATION, ENTREPRENEURSHIP, AND ORGANIZATION
Organizing for Innovation T: 10
Entrepreneurship (Skim) BP: 21
Hermes Systems BP: 22

12. WE 2/21 TECHNOLOGY POLICY AND REGULATION
Guest Resource: Dr. Michael Mandel, Chief Economic Strategist, Progressive Policy Institute and Senior Fellow, Mack Institute for Innovation Management
Robots Will Save the Economy (Skim) C: 9
Facebook, Twitter and Social Media’s Road to Federal Regulation (Skim) C: 10
New Drug Approvals Hit 21-Year High in 2017 (Skim) C: 11
Converting Permissionless Innovation into Public Policy: 3 Reforms (Skim) C: 12

13. MO 2/26 EMERGING TECHNOLOGIES—PAST, PRESENT, FUTURE RP #1
III. LEVERAGING EXTERNAL SOURCES OF INNOVATION: STRATEGIC PARTNERSHIPS

14. WE 2/28 DECIDING BETWEEN INNOVATION STRATEGIES RP #2 Proposal
Organizing for Innovation: When is Virtual Virtuous? *(Skim)*
When to Ally and When to Acquire
Monsanto’s March into Biotechnology (A)

15. MO 3/12 MANAGING STRATEGIC ALLIANCES
How to Make Strategic Alliances Work *(Skim)*
The Relational View: Cooperative Strategy…
Lipitor: At the Heart of Warner-Lambert

16. WE 3/14 MANAGING ALLIANCE NETWORKS
Constellation Strategy: Managing Alliance Groups
Strategy as Ecology *(Skim)*
Star Alliance, 2000
Smarter Ways to Do Business with the Competition
Star Alliance Seeks Integration
Star Alliance Cuts Costs to Stay Ahead

17. MO 3/19 ENGAGING IN CORPORATE VENTURING
Making Sense of Corporate Venture Capital
Intel Capital: The Berkeley Networks Investment

18. WE 3/21 ENGAGING IN STRATEGIC OUTSOURCING RP #2 Outline
Guest Resource: Sreedhar Chittamuri, Vice President & Head of Engineering and Operations for Aerospace and Defense, HCL Technologies
Engineering Services Outsourcing: Unraveling Myths *(Skim)*

19. MO 3/26 PERSPECTIVES ON STRATEGIC TECHNOLOGY MANAGEMENT AB #2
IV. LEVERAGING EXTERNAL SOURCES OF INNOVATION: MERGERS AND ACQUISITIONS

20. WE 3/28  GROWING THROUGH ACQUISITIONS
Capturing the Real Value in High-Tech Acquisitions
The Influence of Organizational Acquisition Experience… (Focus on concepts/findings) BP: 38
Cisco’s Acquisition Strategy (1993 to 2000): Value Growth… BP: 39

21. MO 4/02  DETERMINING INTEGRATION STRATEGIES
Buying Innovation: Managing Technology-Based Acquisitions BP: 40
The MegaMicro Jentronix Transaction and Integration Decisions BP: 41

22. WE 4/04  DISCUSSION OF CURRENT DEALS AND DEVELOPMENTS
Cases to Be Announced in Prior Class

23. MO 4/09  INSIGHTS FROM EXECUTIVES ON M&A AND ALLIANCES
Robert Iger on Acquisition Decision-Making (Disney) C: 21
Padmasree Warrior on Acquisition Implementation (Cisco) C: 22
Charles Giancarlo on Acquisition Implementation (Cisco) C: 23
Juergen Schrempp on Merger Challenges (Daimler-Chrysler) C: 24
Dieter Zetsche on Merger Challenges (Daimler-Chrysler) C: 25
Carlos Ghosn on Alliance Decision-Making and Implementation (Renault-Nissan) C: 26
Jaan Albrecht on Creating and Managing Ecosystems/Alliance Networks (Star Alliance) C: 27

24. WE 4/11  GLOBAL M&A BY EMERGING-Market MULTINATIONALS
What Have We Learned About Emerging-Market MNEs? (Skim) BP: 43
Don’t Integrate Your Acquisitions, Partner with Them BP: 44
China’s Track Record in M&A (Skim) BP: 45
Lenovo Evolves with Its IBM PC Unit in Tow BP: 46
Big Deal? (Skim) BP: 47
Merger, Indian Style: Buy a Brand, Leave It Alone BP: 48
Global Integration the Cemex Way BP: 49
No Small Beer Empire BP: 50

V. PROJECTS AND REVIEW

25. MO 4/16  RP #2 PRESENTATIONS (1/2)

26. WE 4/18  RP #2 PRESENTATIONS (2/2)

27. MO 4/23  KEY ISSUES & OPTIONS IN TECHNOLOGY MANAGEMENT C&P
WE 4/25  Research Papers Due by 5:00pm (No Class) RP #2
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