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: Tuesday/Thursday 1:30-3:00 p.m.

Place: SHDH 215

Instructor: Dr. Saikat Chaudhuri
Assistant Professor of Management
saikatc@wharton.upenn.edu; 215-898-6387

Course Assistants: Avantika Agrawal, Phillip Baker, Juhi Heda, Huanwu Li, Joy Xu

webCafe: https://webcafe.wharton.upenn.edu/eRoom/mgmt/237-sp10-1

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 from Wharton Reprographics

WebCafe (WC): Supplementary assigned articles on WebCafe

Lippincott Websites: http://gethelp.library.upenn.edu/guides/business/mgmt237.html (general resources) http://gethelp.library.upenn.edu/PORT/ (research guidelines)
RULES OF COURSE CONDUCT

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 every one! 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 http://gethelp.library.upenn.edu/PORT/ and/or consult the Lippincott Library staff for further guidance if needed.
# Course Syllabus

## I. UNDERSTANDING TECHNOLOGICAL INNOVATION

1. **TH 1/14  THE NATURE OF TECHNOLOGICAL INNOVATION**
   - **Introduction (Skim)**
   - **Sources of Innovation (Skim)**
   - **Innovation in Industry (Skim)**
   - **Out of the Dusty Labs (Skim)**
   - **This Way to the Future (Skim)**
   - **The Unexpected Science to Come (Skim)**
   - **10 Emerging Technologies (Skim)**
   - **Century of the Sciences (Skim)**
   - **T: 1**
   - **T: 2**
   - **BP: 1**
   - **BP: 2**
   - **WC: 1**
   - **WC: 2**
   - **WC: 3**
   - **WC: 4**

2. **TU 1/19  THE STRATEGIC IMPACT OF TECHNOLOGICAL CHANGE**
   - **Types and Patterns of Innovation**
   - **Why Good Companies Go Bad (Skim)**
   - **Timing of Entry**
   - **Technological Innovation in the Photographic Industry (Skim)**
   - **T: 3**
   - **WC: 5**
   - **T: 5**
   - **BP: 3**

3. **TH 1/21  INNOVATION PATTERNS AND EMERGING VS. ESTABLISHED TECHNOLOGIES**
   - **Patterns of Industrial Innovation**
   - **The Dynamics of Technology and Strategy (Skim)**
   - **Timex Corporation (A) and (B)**
   - **BP: 4**
   - **BP: 5**
   - **BP: 6**

4. **TU 1/26  TECHNOLOGICAL INNOVATION AND STRATEGIC MANAGEMENT**
   - **Defining the Organization's Strategic Direction**
   - **Technology Leadership Can Pay Off**
   - **Technology and Competitive Advantage: The Role of General Management**
   - **Managing Technology as a Strategic Asset**
   - **T: 6**
   - **BP: 7**
   - **BP: 8**
   - **WC: 6**

5. **TH 1/28  WINDOW ON TECHNOLOGICAL INNOVATION**
   - **Guest Resource: Dr. Graham Mitchell, formerly U.S. Assistant Secretary of Commerce for Technology Policy, U.S. Department of Commerce**
   - **Battelle 2010 Global R&D Funding Forecast Report**
   - **The Fading Lustre of Clusters**
   - **RP #1 Proposal**
   - **WC: 7**
   - **WC: 8**
   - **WC: 9**

6. **TU 2/02  PERSPECTIVES ON EMERGING TECHNOLOGY**
   - **AB #1**
II. MANAGING TECHNOLOGICAL INNOVATION AND NEW PRODUCT DEVELOPMENT

7. TH 2/04 TECHNOLOGY AND COMPETITIVE ADVANTAGE
   Standards Battles and Design Dominance (*Skim*)
   T: 4
   The Art of Standards Wars
   WC: 10
   Battle of the Smartphones: BlackBerry vs. iPhone
   WC: 17

8. TU 2/09 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
   WC: 11
   Growing Through Innovation
   WC: 12

9. TH 2/11 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. TU 2/16 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
    WC: 13
    The World's Most Innovative Companies
    WC: 14
    Lessons from Apple
    WC: 15
    Radical Collaboration: Lessons from IBM's Innovation Factory
    WC: 16

11. TH 2/18 TECHNOLOGICAL INNOVATION, ENTREPRENEURSHIP, AND ORGANIZATION
    Organizing for Innovation
    T: 10
    Entrepreneurship (*Skim*)
    BP: 21
    Hermes Systems
    **BP: 22**

12. TU 2/23 WINDOW ON TECHNOLOGICAL INNOVATION
    Guest Resource: Terry Fadem, Director, Corporate Alliances, University of Pennsylvania School of Medicine, Consultant and Senior Fellow, Mack Center for Technological Innovation

13. TH 2/25 EMERGING TECHNOLOGIES—PAST, PRESENT, FUTURE
    **RP #1**
III. **LEVERAGING EXTERNAL SOURCES OF INNOVATION: STRATEGIC PARTNERSHIPS**

14. **TU 3/02**

**DECIDING BETWEEN INNOVATION STRATEGIES**
- Organizing for Innovation: When is Virtual Virtuous? *(Skim)* (BP: 23)
- When to Ally and When to Acquire (BP: 24)
- Monsanto’s March into Biotechnology (A) (BP: 25)

15. **TH 3/04**

**MANAGING STRATEGIC ALLIANCES**
- How to Make Strategic Alliances Work *(Skim)* (BP: 26)
- The Relational View: Cooperative Strategy… (BP: 27)
- Lipitor: At the Heart of Warner-Lambert (BP: 28)

**SPRING BREAK 3/8/10 – 3/12/10**

16. **TU 3/16**

**MANAGING ALLIANCE NETWORKS**
- Constellation Strategy: Managing Alliance Groups (BP: 29)
- Strategy as Ecology *(Skim)* (BP: 30)
- Star Alliance, 2000 (BP: 31)
- Smarter Ways to Do Business with the Competition (BP: 32)
- Star Alliance Seeks Integration (BP: 33)
- Star Alliance Cuts Costs to Stay Ahead (BP: 34)

17. **TH 3/18**

**ENGAGING IN CORPORATE VENTURING**
- Making Sense of Corporate Venture Capital (BP: 35)
- Intel Capital: The Berkeley Networks Investment *(BP: 36)*

18. **TU 3/23**

**ENGAGING IN STRATEGIC OUTSOURCING OF PERIPHERAL TO CORE ACTIVITIES**
- Guest Resource: Sachin Mulay, Wipro Technologies
- R&D Services at Wipro Technologies: Outsourcing Innovation? (BP: 37)

19. **TH 3/25**

**PERSPECTIVES ON STRATEGIC TECHNOLOGY MANAGEMENT**
- **AB #2**
- **RP#2 Outline**
IV. LEVERAGING EXTERNAL SOURCES OF INNOVATION: MERGERS AND ACQUISITIONS

20. TU 3/30  GROWING THROUGH ACQUISITIONS
Capturing the Real Value in High-Tech Acquisitions
The Influence of Organizational Acquisition Experience… (Focus on concepts/findings)
Cisco’s Acquisition Strategy (1993 to 2000): Value Growth…
BP: 38
BP: 39
BP: 40

21. TH 4/01  EMBARKING ON INTEGRATION PLANNING
Making M&As Work: Strategic and Psychological Preparation
HP and Compaq Combined: In Search of Scale and Scope
DaimlerChrysler Merger: The Quest to Create “One Company”
BP: 41
BP: 42
BP: 43

22. TU 4/06  DETERMINING INTEGRATION STRATEGIES
Buying Innovation: Managing Technology-Based Acquisitions
Vermeer Technologies (D), (E), (F)
Post-Merger Integration: How IBM and Lotus Work Together (Skim)
BP: 44
BP: 45
BP: 46

23. TH 4/08  GLOBAL M&A BY EMERGING-MARKET MULTINATIONALS
What Have We Learned About Emerging-Market MNEs? (Skim)
China’s Track Record in M&A (Skim)
Lenovo Evolves with Its IBM PC Unit in Tow
Big Deal? (Skim)
Merger, Indian Style: Buy a Brand, Leave It Alone
Global Integration the Cemex Way
No Small Beer Empire
BP: 47
BP: 48
BP: 49
BP: 50
BP: 51
BP: 52
BP: 53

V. PROJECTS AND REVIEW

24. TU 4/13  FINAL TEAM PRESENTATIONS (1/2)

25. TH 4/15  FINAL TEAM PRESENTATIONS (2/2)

26. TU 4/20  WINDOW ON TECHNOLOGICAL INNOVATION
Guest Resource: Ken Glass (M&T, '82)

27. TH 4/22  KEY ISSUES & OPTIONS IN TECHNOLOGY MANAGEMENT
Team Research Papers due by 5:00pm (No Class)

TU 4/27

RP #2
TABLE OF CONTENTS:

1. Innovation in Industry
2. Out of the Dusty Labs
3. Technological Innovation in the Photographic Industry
4. Patterns of Industrial Innovation
5. The Dynamics of Technology and Strategy
6. Timex Corporation (A) and (B)
7. Technology Leadership Can Pay Off
8. Technology and Competitive Advantage: The Role of General Management
9. The Browser Wars
10. Strategies for Global R&D
11. Technology Map of the World
12. Toyota and Sony: R&D Alone is Not Enough
13. India and China Wise Up to Innovation
14. Managing Real Options
15. Developing Products on Internet Time
16. Silicon Valley Specialists Case
18. GE Sees the Light
19. Built for Innovation
20. Putting the “I” into HP
21. Entrepreneurship
22. Hermes Systems
23. Organizing for Innovation: When is Virtual Virtuous?
24. When to Ally and When to Acquire
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26. How to Make Strategic Alliances Work
27. The Relational view: Cooperative Strategy…
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33. Star Alliance Seeks Integration
34. Star Alliance Cuts Costs to Stay Ahead
35. Making Sense of Corporate Venture Capital
36. Intel Capital: The Berkeley Networks Investment
37. R&D Services at Wipro Technologies: Outsourcing Innovation?
38. Capturing the Real Value in High-Tech Acquisitions
39. The Influence of Organizational Acquisition Experience
40. Cisco’s Acquisition Strategy
41. Making M&A’s Work: Strategic and Psychological Preparation
42. HP and Compaq Combined: In Search of Scale and Scope
43. DaimlerChrysler Merger: The Quest to Create “One Company”
44. Buying Innovation: Managing Technology-Based Acquisitions
45. Vermeer Technologies (D), (E), (F)
46. Post-Merger Integration: How IBM and Lotus Work Together
47. What Have We Learned About Emerging-Market MNEs?
48. China’s Track Record in M&A
49. Lenovo Evolves with Its IBM PC Unit in Tow
Bulkpack Readings (Cont'd)

50. Big Deal?
51. Merger, Indian Style: Buy a Brand, Leave It Alone
52. Global Integration the Cemex Way
53. No Small Beer Empire

WebCafé Readings

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1. This Way to the Future
2. The Unexpected Science to Come
3. 10 Emerging Technologies
4. Century of the Sciences
5. Why Good Companies Go Bad
6. Managing Technology as a Strategic Asset
8. Battelle 2010 Global R&D Funding Forecast Report
9. The Fading Lustre of Clusters
10. The Art of Standards Wars
11. Revving Up
12. Growing Through Innovation
13. 3M’s Innovation Crisis
14. The World’s Most Innovative Companies
15. Lessons from Apple
17. Battle of the Smartphones: BlackBerry vs. iPhone