**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 107

**Instructor:**
Dr. Saikat Chaudhuri  
Assistant Professor of Management  
[saikatc@wharton.upenn.edu](mailto:saikatc@wharton.upenn.edu); 215-898-6387

**Course Assistants:**
Avantika Agrawal, Phillip Baker, Tyler Citek, Karan Dhruve, Huanwu Li

**webCafé:**
[https://webcafe.wharton.upenn.edu/eRoom/faculty/mgmt237-sp11-1](https://webcafe.wharton.upenn.edu/eRoom/faculty/mgmt237-sp11-1)

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**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%).

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**Course Materials**


**Bulk Pack (BP):** Assigned articles and cases from Wharton Reprographics

**WebCafé (WC):** Supplementary assigned articles on WebCafe

**Lippincott Websites:**
[http://gethelp.library.upenn.edu/guides/business/mgmt237.html](http://gethelp.library.upenn.edu/guides/business/mgmt237.html) (general resources)  
[http://gethelp.library.upenn.edu/PORT/](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.
I. UNDERSTANDING TECHNOLOGICAL INNOVATION

1. TH 1/13  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) WC: 1
   - The Unexpected Science to Come (Skim) WC: 2
   - 10 Emerging Technologies (Skim) WC: 3
   - Century of the Sciences (Skim) WC: 4

2. TU 1/18  THE STRATEGIC IMPACT OF TECHNOLOGICAL CHANGE
   - Types and Patterns of Innovation T: 3
   - Why Good Companies Go Bad (Skim) WC: 5
   - Timing of Entry T: 5
   - Technological Innovation in the Photographic Industry (Skim) BP: 3

3. TH 1/20  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

4. TU 1/25  TECHNOLOGY POLICY
   - 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 WC: 8
   - The Fading Lustre of Clusters WC: 9

5. TH 1/27  TECHNOLOGICAL INNOVATION AND STRATEGIC MANAGEMENT  RP #1 Proposal
   - Defining the Organization’s Strategic Direction T: 6
   - Technology Leadership Can Pay Off BP: 7
   - Technology and Competitive Advantage: The Role of General Management BP: 8
   - Managing Technology as a Strategic Asset WC: 6

6. TU 2/01  PERSPECTIVES ON EMERGING TECHNOLOGY  AB #1
II. MANAGING TECHNOLOGICAL INNOVATION AND NEW PRODUCT DEVELOPMENT

7. TH 2/03  TECHNOLOGY AND COMPETITIVE ADVANTAGE
Standards Battles and Design Dominance (*Skim*)  T: 4
The Art of Standards Wars  WC: 10
Tablets vs. Netbooks (vs. Smartphones): Battle for Supremacy…  WC: 11

8. TU 2/08  GLOBAL TECHNOLOGY AND INNOVATION
Strategies for Global R&D  BP: 9
Technology Map of the World  BP: 10
Toyota and Sony: R&D Alone Is Not Enough  BP: 11
India and China Wise Up to Innovation  BP: 12
Revving Up  WC: 12
Growing Through Innovation  WC: 13

9. TH 2/10  MANAGING TECHNOLOGY STRATEGIES AND THE INNOVATION PROCESS
Choosing Innovation Projects  T: 7
Managing Real Options (*Skim*)  BP: 13
Managing the New Product Development Process  T: 11
Developing Products on Internet Time  BP: 14
Silicon Valley Specialists  BP: 15

10. TU 2/15  LESSONS FROM INNOVATIVE FIRMS
Masters of Innovation: How 3M Keeps Its New Products Coming  BP: 16
GE Sees the Light  BP: 17
Built for Innovation  BP: 18
Putting the “I” into HP  BP: 19
3M’s Innovation Crisis  WC: 14
The World’s Most Innovative Companies  WC: 15
Lessons from Apple  WC: 16
Radical Collaboration: Lessons from IBM’s Innovation Factory  WC: 17

11. TH 2/17  TECHNOLOGICAL INNOVATION, ENTREPRENEURSHIP, AND ORGANIZATION
Organizing for Innovation  T: 10
Entrepreneurship (*Skim*)  BP: 20
Hermes Systems  BP: 21

12. TU 2/22  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 2/24  EMERGING TECHNOLOGIES—PAST, PRESENT, FUTURE  RP #1
III. LEVERAGING EXTERNAL SOURCES OF INNOVATION: STRATEGIC PARTNERSHIPS

14. TU 3/01  DECIDING BETWEEN INNOVATION STRATEGIES
Organizing for Innovation: When is Virtual Virtuous? *(Skim)*  
When to Ally and When to Acquire  
Monsanto’s March into Biotechnology (A)  
BP: 22
BP: 23
BP: 24

15. TH 3/03  MANAGING STRATEGIC ALLIANCES  
RP #2 Proposal
How to Make Strategic Alliances Work *(Skim)*  
The Relational View: Cooperative Strategy…  
Lipitor: At the Heart of Warner-Lambert  
BP: 25
BP: 26
BP: 27

SPRING BREAK 3/7/10 – 3/11/10

16. TU 3/15  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  
BP: 28
BP: 29
BP: 30
BP: 31
BP: 32
BP: 33

17. TH 3/17  ENGAGING IN CORPORATE VENTURING  
Making Sense of Corporate Venture Capital  
Intel Capital: The Berkeley Networks Investment  
BP: 34
BP: 35

18. TU 3/22  ENGAGING IN STRATEGIC OUTSOURCING  
Guest Resource: Karthik Nagendra, Manager, Wipro Council for Industry Research, Wipro Technologies  
R&D Services at Wipro Technologies: Outsourcing Innovation?  
BP: 36

19. TH 3/24  PERSPECTIVES ON STRATEGIC TECHNOLOGY MANAGEMENT  
AB #2
RP #2 Outline
IV. LEVERAGING EXTERNAL SOURCES OF INNOVATION: MERGERS AND ACQUISITIONS

20. TU 3/29  
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: 37, BP: 38, BP: 39

21. TH 3/31  
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: 40, BP: 41, BP: 42

22. TU 4/05  
DETERMINING INTEGRATION STRATEGIES  
Buying Innovation: Managing Technology-Based Acquisitions  
Post-Merger Integration: How IBM and Lotus Work Together (Skim)  
BP: 43, BP: 44

23. TH 4/07  
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  

V. PROJECTS AND REVIEW

24. TU 4/12  
WINDOW ON TECHNOLOGICAL INNOVATION  
Guest Resource: Ken Glass (M&T, ’82)

25. TH 4/14  
RP #2 PRESENTATIONS (1/2)

26. TU 4/19  
RP #2 PRESENTATIONS (2/2)

27. TH 4/21  
KEY ISSUES & OPTIONS IN TECHNOLOGY MANAGEMENT  
C&P

TU 4/26  
Research Papers Due by 5:00pm (No Class)  
RP #2
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34. Making Sense of Corporate Venture Capital
35. Intel Capital: The Berkeley Networks Investment
36. R&D Services at Wipro Technologies: Outsourcing Innovation?
37. Capturing the Real Value in High-Tech Acquisitions
38. The Influence of Organizational Acquisition Experience on Acquisition Performance…
39. Cisco’s Acquisition Strategy
40. Making M&A’s Work: Strategic and Psychological Preparation
41. HP and Compaq Combined: In Search of Scale and Scope
42. DaimlerChrysler Merger: The Quest to Create “One Company”
43. Buying Innovation: Managing Technology-Based Acquisitions
44. Vermeer Technologies (D), (E), (F)
45. Post-Merger Integration: How IBM and Lotus Work Together
46. What Have We Learned About Emerging-Market MNEs?
47. China’s Track Record in M&A
48. Lenovo Evolves with Its IBM PC Unit in Tow
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52. No Small Beer Empire
# WebCafé Readings

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2. The Unexpected Science to Come
3. 10 Emerging Technologies
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6. Managing Technology as a Strategic Asset
8. Battelle 2010 Global R&D Funding Forecast Report
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