

**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.

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

Place: JMHH 345

Instructor: Dr. William F. Hamilton  
Landau Professor of Management and Technology  
Director, Fisher Program in Management and Technology  
[hamilton@wharton.upenn.edu](mailto:hamilton@wharton.upenn.edu); 215-898-4145

Graduate Fellow: Han Hu

Course Assistants: Juhi Heda, Saurabh Jalan, Stephen Pike, Kathleen Wu, Joy Xu

webCafe: TBA

**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 written assignments and quizzes (40%), research papers and presentations (45%) and class participation (15%).

**Course Materials**

Text (T): Strategic Management of Technological Innovation, Second Edition, Melissa A. Schilling, McGraw-Hill Irwin, © 2006.

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

WebCafe (WC): Supplementary assigned articles on WebCafe

Course Syllabus

1.	TH 1/15	<b>TECHNOLOGY MANAGEMENT OVERVIEW</b> <u>Strategic Management of Technological Innovation</u> (Skim Preface & all chapters) This Way to the Future The Unexpected Science to Come 10 Emerging Technologies	T: all WC: 1 WC: 2 WC: 3
2.	T 1/20	<b>THE NATURE OF TECHNOLOGICAL INNOVATION</b> Introduction Innovation in Industry Out of the Dusty Labs Century of the Sciences	T: 1, 2 BP: 1 BP: 2 WC: 4
3.	TH 1/22	<b>THE STRATEGIC IMPACT OF TECHNOLOGICAL CHANGE</b> Types and Patterns of Innovation Timing of Entry Technological Innovation in the Photographic Industry Why Good Companies Go Bad	T: 3 T: 5 BP: 3 WC: 5
4.	T 1/27	<b>EMERGING VS. ESTABLISHED TECHNOLOGIES</b> Patterns of Industrial Innovation Timex Corporation (A) and (B) Cases	BP: 4 <b><u>BP: 5</u></b>
5.	TH 1/29	<b>INNOVATION PATTERNS AND TECHNOLOGY FORECASTING</b> Technology in Economy The Dynamics of Technology and Strategy Managing Through Cycles of Technological Change Why Technology Forecasts Often Fail	<b><u>RP #1 Proposal</u></b> BP: 6 BP: 7 BP: 8 WC: 6
6.	T 2/3	<b>PERSPECTIVES ON EMERGING TECHNOLOGY</b>	<b><u>AB #1</u></b>
7.	TH 2/5	<b>TECHNOLOGICAL INNOVATION AND STRATEGIC MANAGEMENT</b> 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: 9 BP: 10 WC: 7
8.	T 2/10	<b>TECHNOLOGY AND COMPETITIVE ADVANTAGE</b> Standards Battles and Design Dominance The Browser Wars	T: 4 TBD
9.	TH 2/12	<b>WINDOW ON TECHNOLOGICAL INNOVATION</b> <u>Guest Resource:</u> Dr. Graham Mitchell, formerly U.S. Assistant Secretary of Commerce for Technology Policy, U.S. Department of Commerce Office of Technology Policy report "Global Context of the U.S. Technology Policy" Battelle 2007 Global R&D Report The Fading Lustre of Clusters	WC: 8 WC: 9 WC: 10
10.	T 2/17	<b>WHAT DOES A MANAGER NEED TO KNOW ABOUT TECHNOLOGY?</b> Far East Semiconductor	<b><u>BP: 11</u></b>

11.	TH 2/19	<b>MANAGING TECHNOLOGICAL INNOVATION</b> EMI and the CT Scanner (B) Case & Background Note-The EMI CAT Scanner	BP: 12
12.	T 2/24	<b>GLOBAL TECHNOLOGY AND INNOVATION</b> Strategies for Global R&D Technology Map of the World Toyota and Sony: R&D Alone Is Not Enough India and China Wise Up to Innovation Revving Up Growing Through Innovation	BP: 13 BP: 14 BP: 15 BP: 19 WC: 11 WC: 12
13.	TH 2/26	<b>EMERGING TECHNOLOGIES--PAST, PRESENT, FUTURE</b>	<b><u>RP #1</u></b>
14.	T 3/3	<b>STRATEGIC CHOICES</b> Silicon Valley Specialists	BP: 16
15.	TH 3/5	<b>MANAGING TECHNOLOGICAL INNOVATION</b> Choosing Innovation Projects Managing the New Product Development Process Managing Technological Change: A Box of Cigars for Brad Managing Real Options	<b><u>RP #2 Proposal</u></b> T: 7 T: 11 BP: 17 BP: 18
<hr/> <b>SPRING BREAK 3/9/09 - 3/13/09</b> <hr/>			
16.	T 3/17	<b>WINDOW ON TECHNOLOGICAL INNOVATION</b> <u>Guest Resource:</u> Terry Fadem, Director, Corporate Alliances University of Pennsylvania School of Medicine Consultant and Senior Fellow, Mack Center for Technological Innovation	
17.	TH 3/19	<b>MANAGING EMERGING TECHNOLOGY</b> Collaboration Strategies FMC Corporation Case B (skim Case A for background) Strategies and Tactics for External Corporate Venturing	T: 8 <b><u>BP: 20</u></b> WC: 13
18.	T 3/24	<b>SELECTED TOPICS IN TECHNOLOGY MANAGEMENT</b> Managing Technology – Corporate Research Managing Technology – Research Personnel The Era of Open Innovation	WC: 21 WC: 22 WC: 23
19.	TH 3/26	<b>TECHNOLOGICAL ENTREPRENEURSHIP</b> Entrepreneurship Business Plans for New Ventures Making Sense of Corporate Venture Capital Technological Innovation: Entrepreneurship and Strategy	<b><u>RP#2 outline</u></b> BP: 21 BP: 22 BP: 23 BP: 24
20.	T 3/31	<b>PERSPECTIVES ON STRATEGIC TECHNOLOGY MANAGEMENT</b>	<b><u>AB #2</u></b>
21.	TH 4/2	<b>EFFECTING CHANGE—TECHNOLOGY, STRATEGY, ORGANIZATION</b> <u>Guest Resource:</u> Professor Saikat Chaudhuri (M&T, '97 ) M&A Case Study Capturing the Real Value in High-Tech Acquisitions The Influence of Organizational Acquisition Experience	TBA BP: 30 BP: 31

22.	T	4/7	<b>LESSONS FROM INNOVATIVE FIRMS</b> Masters of Innovation: How 3M Keeps Its New Products Coming GE Sees the Light Built for Innovation Putting the i in HiP 3M's Innovation Crisis The World's Most Innovative Companies Lessons from Apple Lessons from IBM's Innovation Factory	BP: 25 BP: 26 BP: 27 BP: 28 WC: 14 WC: 15 WC: 16 WC::19
23.	TH	4/9	<b>TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP</b> Hermes Systems	<b><u>BP: 29</u></b>
24.	T	4/14	<b>WINDOW ON TECHNOLOGICAL INNOVATION</b> <u>Guest Resource:</u> Ken Glass (M&T, '82)	
25.	TH	4/16	<b>ORGANIZATIONAL ISSUES AND OPTIONS</b> Organizing for Innovation When is Virtual Virtuous? Bridging the Gap between Stewards and Creators	T: 10 WC: 17 WC: 18
26.	T	4/21	<b>KEY ISSUES &amp; OPTIONS IN TECHNOLOGY MANAGEMENT</b>	<b><u>C&amp;P</u></b>
27.	TH	4/23	<b>FINAL TEAM PRESENTATIONS*</b>	
28.	T	4/28	<b>FINAL TEAM PRESENTATIONS*</b>	
* [W 4/29, TH 4/30, F 5/1: possible alternative final team presentation dates (during reading period)]				
M	5/3		<b>Team Research Papers due by 5:00pm</b>	<b><u>RP #2</u></b>

**Bulkpack Readings****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. Timex Corporation (A) and (B) Cases
6. Technology in Economy
7. The Dynamics of Technology and Strategy
8. Managing Through Cycles of Technological Change
9. Technology Leadership Can Pay Off
10. Technology and Competitive Advantage: The Role of General Management
11. Far East Semiconductor
12. EMI and the CT Scanner (B) Case and Background Note
13. Strategies for Global R&D
14. Technology Map of the World
15. Toyota and Sony: R&D Alone is Not Enough
16. Silicon Valley Specialists Case
17. Managing Technological Change: A Box of Cigars for Brad
18. Managing Real Options
19. India and China Wise Up to Innovation
20. FMC Corporation (A) and (B) Case
21. Entrepreneurship
22. Business Plans for New Ventures
23. Making Sense of Corporate Venture Capital
24. Technological Innovation, Entrepreneurship and Strategy
25. Masters of Innovation: How 3M Keeps its New Products Coming
26. GE Sees the Light
27. Built for Innovation
28. Putting the "I" into HP
29. Hermes Systems
30. Capturing the Real Value in High-Tech Acquisitions
31. The Influence of Organizational Acquisition Experience on Acquisition Performance

**WebCafé Readings**

**TABLE OF CONTENTS:**

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. Why Technology Forecasts Often Fail
7. Managing Technology as a Strategic Asset
8. Office of Technology Policy report "Global Context of the U.S. Technology Policy"
9. Battelle 2007 Global R&D Report
10. The Fading Lustre of Clusters
11. Revving Up
12. Growing Through Innovation
13. Strategies and Tactics for External Corporate Venturing
14. 3M's Innovation Crisis
15. The World's Most Innovative Companies
16. Lessons from Apple
17. When is Virtual Virtuous?
18. Bridging the Gap Between Stewards and Creators
19. Lessons From IBM's Innovation Factory