Course Description

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: TBA

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

Course Assistants:

webCafe:

General Course Organization and 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 (40%), research papers and presentations (45%) and class attendance, participation and quizzes (15%).

Course Materials


Bulk Pack (BP): Required readings and cases, Wharton Reprographics
# Course Syllabus

1. **TH 1/17**
   - **TECHNOLOGY MANAGEMENT OVERVIEW**
     - Strategic Management of Technological Innovation (Skim Preface, all chapters)
     - This Way to the Future
     - The Unexpected Science to Come
     - 10 Emerging Technologies

2. **T 1/22**
   - **THE NATURE OF TECHNOLOGICAL INNOVATION**
     - Introduction
     - Innovation in Industry
     - Century of the Sciences

3. **TH 1/24**
   - **THE STRATEGIC IMPACT OF TECHNOLOGICAL CHANGE**
     - Types and Patterns of Innovation
     - Timing of Entry
     - Technological Innovation in the Photographic Industry

4. **T 1/29**
   - **EMERGING VS. ESTABLISHED TECHNOLOGIES**
     - Patterns of Industrial Innovation
     - Timex Corporation (A) and (B) Cases

5. **TH 1/31**
   - **INNOVATION PATTERNS AND TECHNOLOGY FORECASTING**
     - Technology in Economy
     - Why Technology Forecasts Often Fail
     - The Dynamics of Technology and Strategy
     - Managing Through Cycles of Technological Change

6. **T 2/5**
   - **PERSPECTIVES ON EMERGING TECHNOLOGY**

7. **TH 2/7**
   - **TECHNOLOGICAL INNOVATION AND STRATEGIC MANAGEMENT**
     - Defining the Organization’s Strategic Direction
     - Managing Technology as a Strategic Asset
     - Technology and Competitive Advantage: The Role of General Management
     - Technology Leadership Can Pay Off

8. **T 2/12**
   - **WINDOW ON TECHNOLOGICAL INNOVATION**
     - Guest Resource: 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

9. **TH 2/14**
   - **TECHNOLOGY AND COMPETITIVE ADVANTAGE**
     - Standards Battles and Design Dominance
     - The DVD Battle – Blue-Ray vs. HD-DVD

10. **T 2/19**
    - **WHAT DOES A MANAGER NEED TO KNOW ABOUT TECHNOLOGY?**

11. **TH 2/21**
    - **TECHNOLOGY AND STRATEGY**
      - Strategies for Global R&D
      - Technology Map of the World
      - Toyota and Sony: R&D Alone Is Not Enough
12. T 2/26  MANAGING TECHNOLOGICAL INNOVATION
EMI and the CT Scanner (B) Case, Background Note-The EMI CAT Scanner BP: 19

13. TH 2/28  EMERGING TECHNOLOGIES--PAST, PRESENT, FUTURE RP #1

14. T 3/4  MANAGING TECHNOLOGICAL INNOVATION RP #2 Proposal
Choosing Innovation Projects T: 7
Managing the New Product Development Process T: 11
Managing Technological Change: A Box of Cigars for Brad BP: 20
Managing Real Options BP: 21

15. TH 3/6  STRATEGIC CHOICES IN R&D
Silicon Valley Specialists Case BP: 22

SPRING BREAK 3/10/08 - 3/14/08

16. T 3/18  EFFECTING CHANGE—TECHNOLOGY, STRATEGY, ORGANIZATION
Guest Resource: Dr. Saikat Chaudhuri (M&T,’97), Asst. Professor of Management
Cisco Early if Not Elegant (A) Handout
Capturing the Real Value in High-Tech Acquisitions Webcafe
The Influence of Organizational Acquisition Experience Webcafe

17. TH 3/20  MANAGING EMERGING TECHNOLOGY
Collaboration Strategies T: 8
FMC Corporation Case B; skim Case A for background BP: 25

18. T 3/25  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

19. TH 3/27  TECHNOLOGICAL ENTREPRENEURSHIP
Entrepreneurship BP: 26
Business Plans for New Ventures BP: 27
Making Sense of Corporate Venture Capital BP: 28
Technological Innovation: Entrepreneurship and Strategy BP: 29

20. T 4/1  PERSPECTIVES ON STRATEGIC TECHNOLOGY MANAGEMENT AB #2

21. TH 4/3  INNOVATION NETWORKS/WINDOW ON TECHNOLOGICAL INNOVATION
Guest Resource: Dr. Thomas Kavassalis, Vice President for Technology Strategy and Alliances, Xerox Corporation
The Era of Open Innovation BP: 18

22. T 4/8  LESSONS FROM INNOVATIVE FIRMS
Masters of Innovation: How 3M Keeps Its New Products Coming BP: 30
Building an Innovation Factory BP: 31
How to Kill Creativity BP: 32
GE Sees the Light BP: 33
23. TH 4/10  TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP
   Hermes Systems  BP: 34

24. T 4/15  WINDOW ON TECHNOLOGICAL INNOVATION
   Guest Resource: Ken Glass (M&T, '82)

25. TH 4/17  ORGANIZATIONAL ISSUES AND OPTIONS
   Organizing for Innovation  T:10
   Building a Better Skunkworks  BP: 35
   When is Virtual Virtuous?  BP: 36P

26. T 4/22  COURSE WRAP-UP: KEY ISSUES & OPTIONS IN TECHNOLOGY
   MANAGEMENT  C&P

27. TH 4/24  FINAL TEAM PRESENTATIONS*

28. T 4/29  FINAL TEAM PRESENTATIONS*
   * Alternative presentation schedules:
     (with no class on Tuesday)

   MO 5/5  Team Research Papers due by 5:00pm  RP #2