

PUBP760: Innovation Policy in the 21st Century: Technology, Governance, and Globalization

Spring 2003

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office hours: W 5:30PM - 7:00PM; Th 5:30 PM - 7:00PM.

course credit: 3

1st Day: *January 22*

room: TBA

meeting time: Th 7:20 - 10:00PM

Description

This course investigates the dynamic interaction of technology and governance in a global context. The course focuses on innovative approaches to governance that generate, direct, and respond to rapid technological change, with particular attention to the design and analysis of public policy. We will ask: How do science and technology influence public policy? How does public policy influence the evolution of science and technology? How do the outcomes of these interactions affect well-being in the United States and worldwide? How can the processes involved be made more effective and their outcomes more beneficial? The course is intended to develop (1) students' understanding of theoretical frameworks relevant to these core questions; (2) appreciation for pertinent data and historical context; and (3) ability to undertake informed policy design and analysis. Topics addressed include technology policy for economic growth; efficiency, vulnerability, and counter-terrorism; ethical issues raised by breakthroughs in the life sciences; the role of energy technology innovation in the mitigation of adverse impacts from climate change; and technology and governance for sustainable development.

INTRODUCTION

Over the past century science and technology have fundamentally reshaped the human experience. The public dimension of decisions relating to scientific and technological transformations has expanded accordingly. At the start of the century, the loftiest discussions relating to science and technology pertained to the regulation of medicinals. Today, community, political, and business leaders are challenged to make decisions that have the potential to affect the long term evolution not only of human society, but of the climate and very patterns of life on the planet.

There is every reason to believe that the impact of science and technology will be at least as great in the next hundred years as it was in the last. To what extent should the public and private sector each bear responsibility for not only generating new scientific advances, but also for converting basic science "inventions" into commercial "innovations"? How will individuals with public

responsibilities at different levels of government and in different parts of the globe contend with ethical dilemmas and social disruptions inevitably ensuing from rapid technological change? In short, what public actions can be taken to realize the promise of scientific advance and technological change while mitigating its adverse impacts? These are topics that we will address in this course.

EXPECTATIONS

This class is a seminar. Students will be expected

- to have read the material assigned for each seminar session in advance of the class, and
- to participate actively in discussion of readings and analysis of case studies.

Students who do not participate in class discussion and case studies will have a lower grade than active participants.

In addition to competing readings and participating in class discussions, students are expected to write 3-4 analytic essays (750-1000 words each) based on the readings. These essays will be presented in class. Students may elect to substitute one substantial research paper for the writing of the set of short essays. Those who undertake the writing of a research paper will have the opportunity to present their work to the class at the end of the term. There will also be a final exam in the course assessing understanding of readings and insights regarding core material in the course.

The grade in the course will be determined by the following:

- contributions to class discussion: 20%
- quality of written work (analytic essays or research paper): 50%
- final exam: 30%

COURSE MATERIALS

Readings and cases will be available from either in a course reading packet or online via JSTOR.

Schedule

PART I. HISTORICAL CONTEXT

1. **January 22.** *Innovation policy in the 21st Century: Challenges and opportunities*

2. **January 29.** *Creating new combinations: The long history of human inventiveness*
reading:

Joseph Schumpeter, *The Theory of Economic Development*. New York: Oxford University Press, 1961 [1911], pp. 11-22.

Jane Jacobs, *The Economy of Cities*. New York: Vintage Ed.; 1970 (excerpt).

Jared Diamond, *Guns, Germs, and Steel*. New York: Norton, 1997 (excerpt).

case: The origins of the alphabet.

3. **February 5.** *Innovation, technology, and governance: Parallel evolution, reciprocal impacts*
reading:

Nathan Rosenberg and L.E. Birdzell, *How the West Grew Rich: The Economic*

Transformation of the Industrial World. New York: Basic, 1986 (excerpts).

Douglass C. North, "Economic Performance Through Time," *American Economic Review* 84(3):359-367 (June, 1984).

Martin L. Weitzman, "Hybridizing Growth Theory," *American Economic Review* 86(2): 207-212 (May 1996).

case: The collapse of the former Soviet Union.

4. February 12. From invention to innovation: The brief history of science-based technological change

readings:

Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy*, (Harper Colophon ed.) New York: Harper and Row, 1950 (pp. 81-86).

Nathan Rosenberg and L.E. Birdzell, *How the West Grew Rich: The Economic Transformation of the Industrial World*. New York: Basic, 1986 (excerpts).

case: The "green revolution," past and future?

PART II. DEFINITIONS, FACTS, AND LONG-TERM TRENDS

5. February 19. Technology: The prospects of progress?

reading:

The United States Commission on National Security in the 21st Century (Warren Rudman and Gary Hart, chairs), *New World Coming: American Security in the 21st Century*, 1999.

Bill Joy, "Why the future doesn't need us." *Wired* 8(4), April 2000.

6. February 26. Governance: Ants as architects, architects as ants

reading:

Joseph S. Nye, Jr. and John D. Donahue (eds.), *Governance in a Globalizing World*, Washington DC: Brookings Institution Press, 2000 (chapter 1).

Stephen Johnson, *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*, New York: Scribner, 2001 (excerpts).

7. March 5. Globalization: Millennial trend, historical singularity

readings:

Amartya Sen, "Globalization and Solidarity." Boston University Fredrick S. Pardee Center Distinguished Lecture, November 28, 2001.

David B. Audretsch and A. Roy Thurik, "What's New About the New Economy," Indiana University Institute for Development Strategies working paper, 2001.

March 12. No class (Spring break)

PART III. CHALLENGES AND OPPORTUNITIES

8. March 19. Economic growth: Supporting early stage technology development

readings:

Lewis M. Branscomb and Philip E. Auerswald. *Between invention and innovation: An analysis of funding for early stage technology development*. Advanced Technology Program, National Institute for Standards and Technology NIST, U.S. Department of Commerce, 2002 (excerpts).

case: the Advanced Technology Program (ATP) and the Small Business Innovation Research program

9. March 26. National security: Countering terrorism

readings:

Hart/Rudman report (excerpts)

National Academies of Science Committee on Science and Technology for Countering Terrorism (Lewis Branscomb and Richard Klausner chairs), *Making the Nation Safer: The role of Science and Technology in Countering Terrorism*, Washington, DC: National Academies Press, 2001 (excerpts).

case: Science and technology policy at the Office of Homeland Security?

10. April 2. Health: The century of the life science?

readings: TBA

innovations in practice: DeCode genetics (Iceland); Merck's partnership with the Government of Botswana for HIV/AIDS care and treatment

11. April 9. Energy: Energy Technology Innovation

readings: TBA

case: Partnerships on the next generation of vehicles in China?

12. April 16. Poverty alleviation and democratization: "The bottleneck is at the top of the bottle"?

reading:

Iqbal Quadir, "The Bottleneck is at the Top of the Bottle," *The Fletcher Forum of World Affairs*, Summer/Fall 2002, pp. 69-89.

innovations in practice: GrameenPhone (Bangladesh)

13. April 23. Sustainable development: Preserving local resources, mitigating global climate change

readings: TBA

innovations in practice: Pingree Forest Conservation Program (Maine, USA)

14. April 30. Student presentations

May 7 or 14. FINAL EXAM—2.5 HOURS, CUMULATIVE