

POLS 2390: Science, Technology, and Public Policy
Northeastern University,
Fall 2012

Lectures: Tuesday 11.45am – 1.30pm, Thursday 2.50pm – 4.30pm

Classroom: 210 Shillman Hall

Instructor: Johannes (Hans) Eijmberts

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Office hours: Tuesday 10.30am – 11.30am, Thursday 1pm – 2.30pm

Course Description: The course will provide the students with a general conceptual framework and analytical tools to understand, analyze, and interpret the role of science and technology in public policy formulation. This course focuses on the role of science and technology in the policymaking process not only as a tool, but also as subject of policymaking. Topics covered will include government involvement in innovation and economic growth, the role of the military in the development of science and technology, the governance and regulation of the effects of scientific and technological progress, public funding of science and technology, and ethical aspects of science and technology, including the emerging focus on participatory governance.

To achieve its goals, the course provides students with a range of case studies, introducing them to a more in depth understanding of the role of government in issues like climate change, energy supply, nuclear weapons, transportation, food safety, and medical break throughs.

Essential Readings: All readings on the syllabus are required. The textbook for this course is available at the Northeastern University bookstore. Make sure you purchase the correct edition:

- Teich, Albert H. "Technology and the Future." 12th edition Wadsworth Cengage Learning, Boston (2009) (**Textbook**)

Additional assigned articles and material will be available through the course's Blackboard site or send to all students by e-mail. If you have any problems opening them, please contact the course instructor.

It is required that you follow current developments on science and technology on a daily basis. Be prepared to refer to new sources such as nytimes.com, Science, www.aaas.org, or economist.com. The library also offers access to many news sources through its website, see for instance the *LexisNexis* database.

Course requirements:

Participation:	15%
Reading introduction	10%
2 opinion papers:	10% each
2 quizzes:	10% each
Paper:	25%
Presentation:	10%

Final grades will be determined using the following percentage scale:

A+ = 100 – 97 A = 96 – 93, A- = 92 – 90, B+ = 89 – 87, B = 86 – 83, B- = 82 – 80, C+ = 79 – 77, C = 76 – 73, C- = 72 – 70, D+ = 69 – 67, D = 66 – 63, D- = 62 – 60, F = < 60.

Participation: *Attendance is mandatory.* The instructor keeps track of attendance. If you have circumstances that preclude you from attending, you are expected to inform the instructor in a timely manner. Students are expected to read the assigned texts thoroughly and come to class prepared to contribute to the discussion and to answer any question.

Use of laptops in class is allowed, **actually encouraged**, yet should be limited to taking notes and reviewing course material. Any other use of computers will not be tolerated.

The use in any way of cell phones is not allowed in class.

Reading introduction: Each student will introduce and present an assigned reading during class at a given time. The introduction will reflect the nature of the reading and the basis of the argument of the author. The student is required to make a hand-out for the class, which is to be handed in to the instructor before class.

Opinion pieces: Each student will write two short opinion pieces. For each the student is asked to find and come prepared to discuss news article that relates to one of the broad topics that covered in class. Instructions for completing these opinions will be distributed during the course. All assignments will be submitted through Blackboard. No deadline extension will be offered. Opinions handed in after the specified time will have ten percent subtracted from their final score for each day they are late.

Quizzes: Two quizzes will be held in class, most probably made available through Blackboard. The quizzes will ask for a brief explanation of certain terms or concepts, and might include a short essay question or other assignment.

Research Paper: Each student will write a research paper. Instructions for completing this paper will be distributed during the course. The paper for this course will be no more than 10 – 12 pages, double spaced. The paper will require the use of outside resources. Students **MUST** cite any and all sources used. All assignments will be submitted though Blackboard. No deadline extension will be offered. Papers handed in after the specified time will have ten percent subtracted from their final score for each day they are late.

Presentation: Students will present their paper in a formal 10 minute long Power Point (or similar presentation tool) presentation. A question & answer session will follow. Instructions for completing the presentation will be distributed during the course.

Respect for Others: Discussions in a political science course can occasionally be controversial and disconcerting for some. Students should remember that this is an academic environment in which the primary objective is learning. Though it is not necessary to agree with another's viewpoint (including the instructor's), students are expected to be respectful of other people's perspectives and ideas.

Academic Honesty: WARNING. The Department of Political Science takes very seriously the issue of academic honesty. Any student who appears to violate the University's Academic Honesty and Integrity Policy may be referred to the University's Office of Student Conduct and Conflict Resolution. The Academic Honesty and Integrity Policy includes cheating, fabrication, plagiarism, and other types of dishonest activities. Plagiarism is broadly defined as taking ideas, concepts, or actual words of another person and passing them off as your own work. Of particular note is the increase in cut-and-paste plagiarism, which involves downloading phrases from websites or other internet sources. (See <http://www.northeastern.edu/osccr/academichonesty.html>).

The instructor will clarify specific guidelines on fair use of material for this class. If a proven violation involves an exam or course assignment, the student shall receive a failing grade for the assignment, in addition to sanctions imposed by the Office of Student Conduct and Conflict Resolution. Individual faculty, with the support of the Department, can impose harsher penalties, as they deem necessary.

Policy on Incompletes: Except in the direst circumstances, incompletes in this course are not possible. Would the instructor agree to an incomplete, a form of the Political Science Department must be filled out. It represents a contract between student and the instructor on when and how the course will be completed.

Amendments: The instructor reserves the right to change this syllabus during the semester. In the event of a change, the class will be informed at the next session and an updated copy of the syllabus will be posted on Blackboard. Students are required to have the latest version of the syllabus.

Dates to remember:

Tuesday September 18	Opinion 1 due
Tuesday October 23	Opinion 2 due
Tuesday October 30	Quiz 1
Thursday November 22	Thanksgiving Break – NO CLASS
Tuesday November 27	Research Paper and Presentation due
Thursday December 6	Quiz 2

Tentative course schedule:

Week 1	Thursday Sept 6	Class starts	Introduction of the Course
		REVIEW	Syllabus ON BLACK BOARD
Week 2	Tuesday Sept 11	Introduction	Science & Technology
		READ	“Definitions” in Markert, Linda Rae & Patricia Ryaby Backer “Contemporary Technology: Innovations, Issues, and Perspectives.” (2003) ON BLACK BOARD
		REVIEW	“Definitions” American Association for the Advancement of Science (AAAS), ON BLACK BOARD
		READ	Schatzki, Theodore R. “Nature and Technology in History.” <i>History and Theory</i> . Vol. 42, No. 4, Theme Issue 42: Environment and History. (Dec. 2003) pp. 82 – 93. ON BLACK BOARD
	Thursday Sept 13		History of Science & Technology – Social Studies of Science & Technology
		READ	Jasanoff, Sheila “STS and Public Policy: Getting Beyond Deconstruction.” <i>Science Technology Society</i> (1999) Vol. 4 No. 59 ON BLACK BOARD. *
		READ	Smith, Merritt Roe “Technological Determinism in American Culture” in <i>Does Technology Drive History? The Dilemma of Technological Determinism</i> . Merritt Roe Smith & Leo Marx (Eds.) MIT Press (1994) ON BLACK BOARD *
		READ	Winner, Langdon “Do Artifacts Have Politics?” in Teich. *
Week 3	Tuesday Sept 18	OPINION 1 DUE ON BLACK BOARD	
			Drivers of Science and Technology
		READ	Marx, Leo “Does Improved Technology Mean Progress?” in Teich. *
		READ	David, P.A, “Clio and the Economics of QWERTY.” <i>American Economic Review</i> . Vol 72, No. 2 (1985) pp. 332 – 337 ON BLACK BOARD *

	READ	Rosenberg, Nathan "Science, Invention, and Economic Growth" in <i>Economic Journal</i> Vol. 84, No 333 (1974) ON BLACK BOARD *
	Thursday Sept 20	Public Policy and the Role of Government in Science and Technology
	READ	Albert H. Teich "Government and Technology" in Teich.
Week 4	Tuesday Sept 25	Government of Science and Technology
	LOOK AT	Kraemer, Sylvia "Science and Technology Policy in the United States: Open Systems in Action." (2006) ON BLACK BOARD
	READ	Chapter 2 "Decision Making Framework" in Patrick W. Hamlett, <i>Understanding Technological Politics: A Decision-Making Approach</i> (1991). ON BLACK BOARD
	READ	Matthew C. Nisbet and Chris Mooney "Framing Science" in <i>Science</i> Vol. 316 6 April, 2007 pp. 56 ON BLACK BOARD
	READ	Matthew C. Nisbet and Dietram A. Scheufele "Framing Science: The Future of Public Engagement." Working Paper Sept 6, 2007 ON BLACK BOARD *
	Thursday Sept 27	Science Supports Policy
	READ	Pielke, Roger A. "Four Idealized Roles of Science in Policy and Politics" Chapter 1 in <i>The Honest Broker: Making Sense of Science in Policy and Politics</i> . (2007). ON BLACK BOARD*
		Weinberg, Alvin M. "Can Technology Replace Social Engineering?" In Teich. *
	READ	Kraemer, Sylvia "The Science and Technology Policy Toolkit." Chapter 4 in <i>Science and Technology Policy in the United States: Open Systems in Action</i> . (2006) ON BLACK BOARD *
	READ	"Technocrats: Minds Like Machines" <i>The Economist</i> Nov 19, 2011 ON BLACK BOARD

Week 5	Tuesday Oct 2	Cases: Climate change
	READ	Collins, W. et al "The Science Behind Climate Change." In Teich.
	READ	Eileen Claussen "An Effective Approach to Climate Change." <i>Science</i> , Vol 306, Oct. 2004 ON BLACK BOARD
	LOOK AT	BBC.co.uk "Arguments Made By Climate Change Skeptics." December 2009.
		http://news.bbc.co.uk/2/hi/science/nature/8376286.stm
	Thursday Oct 4	Policy for Science & Technology – Innovation & Economic Growth
	READ	Kraemer, Sylvia "Technology and the Ideology of Free Markets." Chapter 2 in <i>Science and Technology Policy in the United States: Open Systems in Action</i> (2006) ON BLACK BOARD *
	READ	Hamlett, Patrick W. "The Corporate Managerial Arena." Chapter 3 in <i>Understanding Technological Politics: A Decision-Making Approach</i> .(1991) ON BLACK BOARD
	READ	Sabety, Ted "Nanotechnology Innovation and the Patent Thicket: Which IP Policies Promote Growth?" <i>Nanotechnology Law & Business</i> Vol. 1. No. 3 (2004). ON BLACK BOARD *
	READ	Branscomb, Lewis M. "What's Next in Technology Policy?" <i>Issues in Science and Technology</i> (Summer 2003) pp. 16 – 18 ON BLACK BOARD
Week 6	Tuesday Oct 9	Policy for Science & Technology: Risk & Regulations
	READ	Chapter 9 "Risk in the Technological Society" in Patrick W. Hamlett, <i>Understanding Technological Politics: A Decision-Making Approach</i> . (1991). ON BLACK BOARD
	READ	Luigi Pellizzoni and Marja Ylönen "Responsibility in Uncertain Times: An Institutional Perspective on Precaution." <i>Global Environmental Politics</i> . Vol. 8 No. 3

(Aug 2008). ON BLACK BOARD *

READ Burgess, Adam "The Making of the Risk-centered Society and the Limits of Social Risk Rsearch." *Health, Risk, and Society*. Vol. 8 No. 4 (Dec 2006): 329 – 342. ON BLACK BOARD *

REVIEW RIVM "Coping Rationally with Risk." 2 pages ON BLACK BOARD

Thursday Oct 11 Case on Risk & Regulation – Antennas for Wireless Service

In class documentary & discussion

Week 7 Tuesday Oct 16 Policy for Science & Technology – International Patterns & Cooperation.

BROWSE "National Innovation Systems." OECD 1997. ON BLACK BOARD.

READ Smith, David A. "Technology and the Modern World-System: Some Reflections" *Science, Technology, & Human Values*, Vol. 18, No. 2 (Spring, 1993), pp. 186-195 ON BLACK BOARD *

READ Schott, Thomas "World Science: Globalization of Institutions and Participation." *Science, Technology, and Human Values*, Vol 18, No 2 (Spring 1993), pp. 196 – 208. ON BLACK BOARD *

READ Woodhouse, Edward and Daniel Sarewitz "Science Policies for Reducing Societal Inequities." In *Science and Public Policy*. Vol. 34 No. 3 (March 2007), pp. 139 – 150 ON BLACK BOARD *

Thursday Oct 18 Public Funding of Science and Technology

READ Smith, Bruce L.R "The Post War Consensus." Chapter 3 in *American Science Policy Since World War II*. (1990) ON BLACK BOARD. *

READ "Technology Transfer" Chapter 7 in Markert, Linda Rae & Patricia Ryaby Backer "Contemporary Technology:

		Innovations, Issues, and Perspectives.” (2003) ON BLACK BOARD
	REVIEW	DARPA Technological Spill Over. ON BLACK BOARD
	LOOK AT	Historical Trends in US R&D Funding AND USA R&D Budget request 2012 ON BLACK BOARD
Week 8	Tuesday Oct 23	OPINION 2 DUE ON BLACK BOARD
		Case: CERN
	READ	Aymar, R. “Basic Science in a Competitive World.” http://public.web.cern.ch/public/en/About/BasicScience-en.html
	READ	Scientists Getting Clearer Picture of God Particle, CNN Blog March 7, 2012 http://lightyears.blogs.cnn.com/2012/03/07/scientists-getting-clearer-picture-of-god-particle/
	Thursday Oct 25	Education.
	READ	Bybee, Roger W. and Bruce Fuchs “Preparing the 21st Century Workforce: A New Reform” in <i>Science and Technology Education Journal of Research in Science Teaching</i> . Vol. 43, No. 4, (2006): 349–352 ON BLACK BOARD
	REVIEW	“Federal Role in Education.” US Department of Education. www.ed.gov ON BLACK BOARD
	READ	<i>The Economist</i> : ON BLACK BOARD “Angst for the Educated.” Sept. 3, 2011 “Economics Focus: Marathon Machine.” Nov. 19, 2011
	READ	“Is a US Brain Drain on the Horizon?” http://yaleglobal.yale.edu/content/us-brain-drain-horizon
	READ	Lawrence M. Krauss “Science vs. Religion in the ID Debate” <i>Free Inquiry</i> . Vol. 26, No. 3 (April/May 2006) pp. 36-40
Week 9	Tuesday Oct 30	Quiz

Critical of Science – Afraid of New Technology

READ Berry, Wendell “Why I Am Not Going to Buy a Computer.” In Teich 11th ed. (5 pages only!)

READ “Social Response to Technological Change” Chapter 11 in Markert, Linda Rae & Patricia Ryaby Backer in “Contemporary Technology: Innovations, Issues, and Perspectives.” Goodheart-Willcox Company, Tinley Park IL USA (2003) ON BLACK BOARD

Thursday Nov 1 National Security and Science & Technology

READ Hamlett, Patrick W. “The Military Industrial Complex. “ Chapter 7 in *Understanding Technological Politics: A Decision-Making Approach*. (1991) ON BLACK BOARD

READ *The Economist*. Oct. 8, 2011 “Flight of the Drones: Why the Future of Air Power Belongs to Unmanned Systems.” ON BLACK BOARD

READ *The Economist*. Jan 21 2012 Peter W. Singer “Do Drones Undermine Democracy? ON BLACK BOARD

READ Lemnios, Zachery, “Science and Technology Keynote” to the Defense Technology and Requirements Conference, Washington, D.C. 17 Feb. 2010*

REVIEW AAAS Department of Defense Science & Technology 2011 Budget Analysis ON BLACK BOARD

BROWSE MIT Institute for Soldier Nanotechnologies
<http://web.mit.edu/isn/>

Week 10 Tuesday Nov 6 Case study: E Voting

READ Blazarotti, Davide et al “An Experience in Testing the Security of Real-World Electronic Voting Systems” in *Transactions on Software Engineering*. Vol. 36, No. 4 July / August 2010 ABSTRACT and Sections 1, 8, 9, and 10 ON BLACK BOARD.

Bederson, Benjamin B. et al "Electronic Voting System Usability Issues." ABSTRACT, Introduction, and Conclusion. ON BLACK BOARD.

Hidalgo, Daniel F. "Digital Democracy: The Consequences of Electronic Voting Technology in Brazil." ABSTRACT and Introduction. ON BLACK BOARD.

Mebane, Walter R. "Can We Trust Machines?" in *Science*. Vol. 322, 31 October 2008. ON BLACK BOARD

"Check that Vote" *NY Times* editorial, July 16, 2008. ON BLACK BOARD.

Thursday Nov 8 Ethics – Social Consequences

READ Greely, Henry T. "Some Possible Legal and Social Implications of Advances in Neuroscience." In Teich.*

READ Sandel, Michael J. "The Case Against Perfection." In Teich.

READ Thomas Scott, Christopher "Stem Cell Research: The Great Moral Divide." In Teich.

Week 11 Tuesday Nov 13 Participatory government

READ Fukuyama, Francis and Caroline Wagner "Governance Challenges of Technological Revolutions." ON BLACK BOARD *

READ Gerardi Riordan, Donna "Research Funding via Direct Democracy: Is it Good for Science?" in *Issues in Science and Technology* (Summer 2008) pp. 23 – 27 ON BLACK BOARD.

Thursday Nov 15 Case: Space - TBD

READ Neil deGrasse Tyson "The Case for Space" *Foreign Policy* March / April 2012 ON BLACK BOARD

READ Neil deGrasse Tyson "Back to the Final Frontier" *Discover Magazine* April 2012 ON BLACK BOARD

Week 12	Tuesday Nov 20	Critical thoughts: Discussion
	READ	Joy, Bill “Why the Future Doesn’t Need Us.” In Teich. *
	READ	Kurzweil, Ray “Promise and Peril.” In Teich.*
	READ	Coates, V. et al “On the Future of Technological Forecasting” <i>Technological Forecasting and Social Change</i> Vol. 67 (2001) pp. 1 – 17 *
	Thursday Nov 22	NO CLASS THANKSGIVING BREAK
Week 13	Tuesday Nov 27	PAPERS & PRESENTATIONS DUE
		Presentations
	Thursday Nov 29	Presentations
Week 14	Tuesday Dec 4	Presentations
	Thursday Dec 6	QUIZ (date optional)