

POLS 7333: Science, Technology, and Public Policy
Northeastern University,
Spring 2013

Meetings: Thursday 5.15pm – 7.45pm
Classroom: 5 Kariotis Hall

Instructor: Johannes (Hans) Eijmberts
E mail: j.eijmberts@neu.edu
Office: 307a Meserve Hall
Tel.: 617 888 9021 (cell)
Office hours: Thursday 3pm – 5pm
And by appointment

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 broader societal and ethical consequences of science and technology, including the emerging attention to 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: | 20% |
| 2 Reading Introduction | 10% each |
| 2 Opinion papers: | 10% each |
| Paper: | 30% |
| Presentation: | 10% |

Final grades will be determined using the following percentage scale:

A = 100 – 93, A- = 92 – 90, B+ = 89 – 87, B = 86 – 83, B- = 82 – 80, C+ = 79 – 77, C = 76 – 73, C- = 72 – 70, F = < 70.

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 handout 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.

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 around 15 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:

| | |
|----------------------|--|
| Thursday January 24 | Opinion 1 due on black board |
| Thursday February 28 | Opinion 2 due on black board |
| Thursday March 7 | No class – Spring Break |
| Thursday April 11 | Paper & Presentation due – presentations |
| Thursday April 18 | Presentations |

Tentative course schedule:

| | | | |
|--------|-----------------|-------------------------------------|--|
| Week 1 | Thursday Jan 10 | Class starts | Introduction of the Course |
| | | REVIEW | Syllabus ON BLACK BOARD |
| Week 2 | Thursday Jan 17 | | Introduction Science & Technology History of Science & Technology – Social Studies of 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 |
| | | 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 | Thursday Jan 24 | 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 |

| | | |
|--------|-----------------|--|
| | | <p>READ Rosenberg, Nathan "Science, Invention, and Economic Growth" in <i>Economic Journal</i> Vol. 84, No 333 (1974) ON BLACK BOARD</p> |
| Week 4 | Thursday Jan 31 | <p>Public Policy and the Role of Government in Science and Technology: Government of Science and Technology</p> <p>READ Albert H. Teich "Government and Technology" in Teich.</p> <p>LOOK AT Kraemer, Sylvia "Science and Technology Policy in the United States: Open Systems in Action." (2006) ON BLACK BOARD</p> <p>READ Chapter 2 "Decision Making Framework" in Patrick W. Hamlett, <i>Understanding Technological Politics: A Decision-Making Approach</i> (1991). ON BLACK BOARD</p> <p>READ Matthew C. Nisbet and Chris Mooney "Framing Science" in <i>Science</i> Vol. 316 6 April, 2007 pp. 56 ON BLACK BOARD</p> <p>READ Matthew C. Nisbet and Dietram A. Scheufele "Framing Science: The Future of Public Engagement." Working Paper Sept. 6, 2007 ON BLACK BOARD *</p> |
| Week 5 | Thursday Feb 7 | <p>Science Supports Policy</p> <p>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</p> <p>Weinberg, Alvin M. "Can Technology Replace Social Engineering?" In Teich.</p> <p>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</p> <p>READ "Technocrats: Minds Like Machines" <i>The Economist</i> Nov 19, 2011 ON BLACK BOARD</p> <p>Case: Climate change</p> |

- READ Collins, W. et al "The Science Behind Climate Change." In Teich.
- READ Claussen, Eileen "An Effective Approach to Climate Change." *Science*, Vol. 306, Oct. 2004 ON BLACK BOARD
- READ Moniz, Ernest "Why We Still Need Nuclear Power" *Foreign Affairs* Vol. 83 Nov.-Dec. 2011 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>

- Week 6 Thursday Feb 14 Policy for Science & Technology – Innovation & Economic Growth - Policy for Science & Technology – International Patterns & Cooperation.
- READ Kraemer, Sylvia "Technology and the Ideology of Free Markets." Chapter 2 in *Science and Technology Policy in the United States: Open Systems in Action* (2006) ON BLACK BOARD
- READ Hamlett, Patrick W. "The Corporate Managerial Arena." Chapter 3 in *Understanding Technological Politics: A Decision-Making Approach*.(1991) ON BLACK BOARD
- READ Sabety, Ted "Nanotechnology Innovation and the Patent Thicket: Which IP Policies Promote Growth?" *Nanotechnology Law & Business* Vol. 1. No. 3 (2004). ON BLACK BOARD
- Review examples : Johnson, Steven "Inventors Gold" in *Wired* Oct. 2012 and Levy, Steven "The Patent Problem" in *Wired* Dec. 2012 ON BLACK BOARD
- READ Branscomb, Lewis M. "What's Next in Technology Policy?" *Issues in Science and Technology* (Summer 2003) pp. 16 – 18 ON BLACK BOARD
- READ 'Innovation Pessimism: Has the ideas machine broken down?' *The Economist* Jan. 12, 2013 pp. 21 -24 ON BLACKBOARD

- 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

- Week 7 Thursday Feb 21 Policy for Science & Technology: Risk & Regulations
- READ Chapter 9 "Risk in the Technological Society" in Patrick W. Hamlett, *Understanding Technological Politics: A Decision-Making Approach*. (1991). ON BLACK BOARD
- READ Pellizzoni, Luigi and Marja Ylönen "Responsibility in Uncertain Times: An Institutional Perspective on Precaution." *Global Environmental Politics*. 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 Research." *Health, Risk, and Society*. Vol. 8 No. 4 (Dec 2006): 329 – 342. ON BLACK BOARD
- READ Vogel, David "Explaining Regulatory Policy Divergence." Chapter 2 in *The Politics of Precaution*. Princeton University Press (2012) ON BLACK BOARD
- REVIEW RIVM "Coping Rationally with Risk." 2 pages ON BLACK BOARD

Case on Risk & Regulation:

- Week 8 Thursday Feb 28 **OPINION 2 DUE ON BLACK BOARD**

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

Case Funding of Basic Research: CERN

- READ Folger, Tim “Higgs: What Causes the Weight of the World?” *Discover* Jan. 2013 pp 16 -17. ON BLACK BOARD
- 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/>

WEEK 9 SPRING BREAK

WEEK 10 Thursday March 14 Education.
Critical of Science – Afraid of New Technology

- READ Bybee, Roger W. and Bruce Fuchs “Preparing the 21st Century Workforce: A New Reform” in *Science and Technology Education Journal of Research in Science Teaching.* 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 *The Economist:* ON BLACK BOARD

“Angst for the Educated.” Sept. 3, 2011
“Economics Focus: Marathon Machine.” Nov. 19, 2011

READ Lowe, Derek “America Doesn’t Have a Scientist Shortage.”
Discover Magazine (Oct. 2012) p. 16.

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”
Free Inquiry. Vol. 26, No. 3 (April/May 2006) pp. 36-40

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

Week 11 Thursday March 21 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/>

National Security Cases:

- Cyber security
- Drones

| | | |
|---------|-------------------|---|
| Week 12 | Thursday March 28 | Ethics – Social Consequences Participatory Governance |
| | 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. |
| | 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 <i>Issues in Science and Technology</i> (Summer 2008) pp. 23 – 27 ON BLACK BOARD. |
| | READ | Fung, Archon and Erik Olin Wright “Deepening Democracy: Innovations in Empowered Participatory Governance.” <i>Politics & Society</i> . Vol. 29 No. 1 (March 2001) pp. 5 – 41. ON BLACK BOARD |
| | REVIEW | “Dutch Media Blast Santorum Comments on Euthanasia” Boston Globe February 23, 2012. ON BLACK BOARD |
| Week 13 | Thursday April 4 | Anticipatory Governance |
| | 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 ON BLACK BOARD |
| | READ | Bezold, Clement. Paper based on: <i>Anticipatory Democracy: People in the Politics of the Future</i> . (1978) New York: |

Random House

Case: Space:

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

REVIEW "Emerging Space Powers" ON BLACK BOARD

Week 14 Thursday April 11 **PAPERS & PRESENTATIONS DUE**

Presentations

Week 15 Thursday April 18 Presentations