

August 30<sup>th</sup> 2018

RES 507 Human and Technological Systems  
GPP 542 Science and Technology Policy  
Syllabus Outline

Instructor	Office	Office Hours	Email
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### Class Time and Place:

9 am to 12 noon, Thursdays, AERL 107, 2202 Main Mall, UBC-V Campus.

### Course Overview

This course introduces students to the role and influence of science and technology in society, and its relationship to public policy, human development and the environment. The influence of science and technology on public policy is bidirectional. Science and technology (S&T) is influenced by policy decisions (policy for science) and in turn influences public policy (science for policy). The course introduces students to this bidirectional interaction. The approach is multidisciplinary, drawing upon literature in a wide range of fields including: economics of technological change, philosophy of science, environmental science and engineering, psychology, sociology and history of technology. We will also rely upon the extensive literature written by scientists, engineers and policy analysts in their role as policy observers, advisors and *advocates*. While this literature tends to draw heavily on the North American and European cases, the course will strive to incorporate concerns and cases in the developing world, and problems of poverty and inequity worldwide.

### Learning Outcomes:

By the end of this course, students should be able to:

- Demonstrate broad understanding of the relationships between science, technology and society;
- Articulate the differences and interconnections between science and technology;
- Describe sources of technological change and their influence on the economy, on society and the local and global environment;
- Explain how government policy, including patent protection and government funded R&D, influences the development of new technologies (including 'green' ones);
- Explain how science-policy advisory systems operate, how technology assessment is conducted, and how it can influence public policy;
- Articulate the basic concepts of public perception of science;
- Explain how social groups actively bring about or resist technological change;
- Apply course concepts and tools to analyze 'real-world' science-policy controversies.

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## Course Format:

The course is organized to maximize opportunities for mutual learning and feedback. Each week, there are assigned readings to prepare for the discussions of the week ahead. Subsequent to the discussion, you are expected write up a one-page reflection on the readings and discussions that ensued. These are, intended to help you develop the skills and background knowledge necessary to succeeding in understanding and shaping science-technology & policy either as a professional or as an active citizen.

## Course Requirements

This course will require that students apply concepts from a variety of disciplines. A background in a scientific or technical field is useful but not necessary. Students are expected to attend each class session, to prepare for each session by completing the weekly readings, and to participate actively and constructively in class discussions.

## Evaluation Criteria and Grading

- The presentation and short reflections will allow students to demonstrate their understanding of course concepts and major debates within the literature.
- The policy briefs will enable students to synthesize key ideas in a succinct manner and to communicate them in a format a policymaker might demand.
- The Group Case study will allow integration of your emerging knowledge in addressing important “real-world” policy problems.

Assignments	Due Dates	% of final grade
Short Reflections	Weekly	20%
In-class discussions & activities	Weekly	20%
Presentation of a paper	Random week	5%
Policy brief (individual effort)	Due Oct 12 <sup>th</sup> & Nov 9 <sup>th</sup>	20%
Case study Presentation (group effort)	Due Dec 7 <sup>th</sup>	35%

### Short Reflections (20%)

The readings for each week will prepare you for discussions of the class that follows. After that class you can reflect on what you have learned. These should be short and pithy (no more than a page). These will be reviewed to provide feedback to you and to me. The former helps me track your progress. The latter helps me refine the course content and presentation to better match the audience.

### Presentation of readings (5% per paper)

The class will be asked to read two or three papers in preparation for class each week. Each student will be asked to present a paper to their peers. This involves presenting the main points of the paper and any critiques they may have and leading a discussion by their peers of its content.

### In-Class Activities – 20%

- Students are expected to have thoroughly read the assigned readings and prepared to participate actively in class discussions, debates and workshops.
- Students will be providing feedback on one another's policy briefs.
- Students will be working together on their joint projects.

These and many other in class activities demands your total engagement. The more you engage, the more you can take away from the course.

### Policy brief – 20%

A policy brief is a short document (~1500 words) that takes various forms. It can present the findings and recommendations of a research project to a non-specialist audience, it can be a medium for exploring an issue and distilling lessons learned from the research, or it can be vehicle for providing policy advice<sup>1</sup>. You will be asked to write two policy briefs on topics of your choice. One policy brief should be aimed at a public sector decision-maker. The other policy brief should be aimed at a private sector decision-maker. You can find examples and suggestions for policy briefs here:

1. <http://writingcenter.unc.edu/policy-briefs/>
2. <http://www.ids.ac.uk/publication/achieving-diverse-development-goals-how-can-different-goals-be-pursued-together>
3. <http://www.ids.ac.uk/publication/edible-insects-and-the-future-of-food>
4. <https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/policybrief34.pdf>

### Case Study (Total 35%)

Students will work in groups on a selected science and technology topic to apply and integrate the tools and knowledge acquired through the term. The projects will be judged on:

- a) Qualitative description (30%):
  - i. The origin of the issue (its history etc.) and potential analogues.
  - ii. Responsibility for its emergence (if there is one).
  - iii. Distributional aspects of its costs and benefits.
  - iv. Quality of knowledge about the problem, its causes and potential solutions.
  - v. Institutions, laws and customs that may be relevant.
- b) Data/evidence (20%):
  - i. What evidence or empirical material supports the concerns?
  - ii. What are the uncertainties?
- c) Analysis of options and policy advice (35%):
  - i. What are the short to long-term strategies/policies for addressing this challenge?
  - ii. What forms would appropriate policies take?
- d) Overall presentation quality: (15%)
  - i. How well articulated, integrated and readable is your report?
  - ii. Have you made good use of high quality visuals?
  - iii. Would your neighbour be persuaded by this report?

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<sup>1</sup> This is the IDRC's (now Global Affairs Canada) definition.

**Course Schedule**

Week	9-11:50	Readings	Assignments
0	Please read these papers before our first class	Demeritt, D. vs. Schneider S.H (2001); Pielke Jr (2002)	
1	<ul style="list-style-type: none"> <li>• Introductions and course expectations.</li> <li>• Are Policy &amp; Science conjoined twins or isolated realms? (Socrates, Seneca, Hypatia, Pythagoras, etc. were murdered for their political stands)</li> </ul>	Jasanoff (2003, 1987); Handbook of Policy Analysis	<ul style="list-style-type: none"> <li>• Weeks 0-10: read papers &amp; prepare to engage in the class discussion</li> <li>• Weeks 1-11: write a 1-page reflection on the readings and class discussion.</li> <li>• Also, develop your policy briefings they are due Oct 12<sup>th</sup> and Nov 9<sup>th</sup></li> <li>• Also, develop your group Case Study and prepare your final report for submission by Dec 7<sup>th</sup>.</li> </ul>
2	Science-policy advisory processes and institutions.	Fehr & Fischbacher;(2004); C&H Boesch (1990); Young (2007); Schmidt et al. 2012	
3	Intelligence, technology & emergence of social norms	Clark (1981); Slovic (1987); Wilson & Crouch (1987); Ames et al (1987); Russell & Gruber (1987)	
4	Risks: objective, exceptions, perceptions and governance	Gelderblom et al. (2013); Irwin (1991); Prager (1961).	
5	Privilege, priority, patents and monopolies - development & commerce	Lele & Goldsmith (1989); Pignali (2012); Trouiller et al (2002); Kammen & Dove (1998);.	
6	Science Based Development (INCLIN, Green Revolution, ...) Effective demand & R&D spending	Kahan et al (2012); Lave (1997); Pidgeon & Fischhoff (2011).	
7	Policy & uncertainty, Exceptional circumstance and frontiers of technical progress	<i>No readings this week – prepare your project previews</i>	
8	Class project previews & feedback: Plastics, Crisper, AI and ET	Marshall (1987); Schneider (1988); Slovic (1999); Herring (2008).	
9	The scientific process of court of public opinion	Atman et al. (1994a,b); Wong-Parodi et al. (2011).	
10	Bridging the gap between public-expert understanding mental models of social marketing	Galor & Neil (2000); Henrich (2000); Konow (2000); Rezaei & Dowlatabadi (2015); Hayakawa et al. (2000)	
11	Cultural dimensions of policy		
12	Emerging issues: Plastics & CRISPER		
13	Emerging issues: AI & ET		

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Course readings are organized by week in the shared workspace.

#### Video Material:

AI/Robotics: Why We Will Rely on Robots – Rodney Brooks

<https://youtu.be/nA-J0510Pxs>

Science and Trust: Naomi Oreskes.

<https://www.youtube.com/watch?v=RxyQNEVOEIU>

End of Growth: Robert Gordon.

<https://www.youtube.com/watch?v=gDmX0fG0so4>

Has innovation peaked: Joel Mokyr.

<https://www.youtube.com/watch?v=h5x3rdD0tSU>

The Long Tail: Chris Anderson

[http://www.ted.com/talks/chris\\_anderson\\_of\\_wired\\_on\\_tech\\_s\\_long\\_tail?language=en](http://www.ted.com/talks/chris_anderson_of_wired_on_tech_s_long_tail?language=en)

[Being Mortal: Love and Cancer at 27 \[Frontline\]](#)

<http://www.pbs.org/wgbh/frontline/article/love-and-cancer-at-27/>

#### Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging other sources of information or ideas with attribution. Students should not cheat, copy, or mislead others about their work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise. These entail serious consequences and imposition of harsh sanctions. For example, incidences of plagiarism or cheating will result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Details at: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0>.

#### Access & Diversity:

The university strives to create an inclusive living and learning environment for all students. The university accommodates students with disabilities who have registered with the Access & Diversity unit: [<http://www.students.ubc.ca/access/drc.cfm>].

#### Religious Accommodation:

The university accommodates students whose religious obligations conflict with attendance, submitting assignments, or completing scheduled tests and examinations. Students should let their instructor know in the first week of class, if they will require any accommodation on these grounds. Students who plan to be absent for varsity athletics, family obligations, or other similar commitments, cannot assume they will be accommodated, and should discuss their commitments with the instructor before the course drop date. UBC policy on Religious Holidays: <http://www.universitycounsel.ubc.ca/policies/policy65.pdf>

#### UBC Statement on Respectful Environment for Students, Faculty and Staff

The University of British Columbia envisions a climate in which students, faculty and staff are provided with the best possible conditions for learning, including an environment that is dedicated to excellence, equity and mutual respect. UBC strives to realize this vision by establishing practices that respect the dignity of individuals, free from harmful behaviours such as bullying and harassment.