# University of Massachusetts at Boston

# Public Policy Program, McCormack Graduate School of Policy Studies

# Critical & Creative Thinking Program/ Science in a Changing World track, College of Advancing & Professional Studies

# Scientific and Political Change

# PPol G 749/ CrCrTh 649

# Syllabus, Spring 2014

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Office: Wheatley 2nd flr 157 (on back corridor parallel to main long corridor)
Class meetings: Weds 4-6.30pm (Online students join all course sessions by google+ hangout)
Office/phone call hours: Weds 2-3.40pm by sign up (http://ptaylor.wikispaces.umb.edu/PTOfficeHours) or by arrangement

## Course webpages

*bookmark wiki & blog on the browser of each computer you use*
Wiki: http://ppol749.wikispaces.umb.edu, including:

- Syllabus, with requirements, and schedule of sessions
- Notes on assignments, other expectations, grading system. (Note: These are only briefly described in this syllabus.)
- PBL Cases
- and other items in the menu on the right of the wikipage

Class blog: http://blogs.umb.edu/ppol749-s14 (login required), for posting

- Annotated bibliography entries
- Notes or other assignments on inquiries-in-progress
- Products from each PBL, after revision in response to comments

## Sections to Follow in Syllabus

## Catalog description*

Prior to WW II, the American government played a relatively small role in the support of science, especially outside of its own institutions. That situation changed dramatically with the war and the Cold War that followed. We explore how these events transformed the role of science in American life, vastly enhancing the prestige of scientists, and shaping the extent and the nature of federal involvement in science. These and later developments, including the commercialization of academic research, raise important questions about the appropriate role of science and scientists in a democracy. In particular: How can we reconcile the need for scientific and technological expertise on the one hand, and for the democratic control of science on the other? We consider different theoretical approaches to this issue, and illustrate the dilemmas it poses with a number of empirical examples.

- ** This official description warrants updating to reflect the attention of the course to comparative perspectives and international concerns.*

## Course Overview

After an initial session in which students are introduced to the "Project- (or problem-) based learning" (PBL) format, the course consists of 4 three-session units based on cases concerning scientific and political change. The PBL approach allows students to shape their own directions of inquiry and develop their skills as investigators and prospective teachers. Students' inquiries are guided by individualized bibliographies co-constructed with the instructor and informed by the projects of the other students. Students are asked to keep three broad goals in view:

1. To learn about analyses of the political influences on the development of science and technology, and, reciprocally, of influences of such developments on political processes and possibilities;
2. To re-engage with yourselves as avid learners and inquirers; and
3. To organize resources that prepare you to teach and engage students and members of the relevant communities to participate in questioning and shaping the direction of scientific and social changes.

What makes the re-engagement in #2 possible is a combination of:

- the tools and processes used for inquiry, dialogue, reflection, and collaboration;
- the connections they make with other students (and guests) who bring diverse interests, skills,

knowledge, experience, and aspirations to the process; and
- their contributions to the topic laid out in the scenarios from which the PBL units begin.

The broad topics covered by the PBL units are:

- 1. Science-policy connections (to improve responses to extreme climatic events and address uncertainties. To whom and in what circumstances is it important to reduce uncertainties in the predictions and applications of research?)
- 2. Science and democratic participation; Infrastructure. (Who is included/excluded in shaping research and its applications? What is the infrastructure of participation and exclusion? In what ways are the included/ excluded parties made to matter?)
- 3. Comparatives perspectives; Infrastructure. (A comparison of policy development in U.S. and Europe concerning infrastructure built so that new genetic knowledge is useful.)
- 4. Education and civic engagement (How to teach and engage others to participate in questioning and shaping the direction of scientific and social changes?)

## PREREQUISITES and preparation assumed for this course

Graduate standing or permission of instructor. In lieu of other formal prerequisites, your previous studies should have prepared you to formulate and pursue library and internet research and to write, seek feedback, and revise in systematic and efficient ways with minimal supervision (see research and study competencies).

## Texts and Materials

Frickel, S. and K. Moore (eds.) (2006). The new political sociology of science: institutions, networks, and power. Madison, WI, University of Madison, Wisconsin. (Available online via Ebrary)

Hackett, E., O. Amsterdamska, et al., Eds. (2008). The Handbook of Science and Technology Studies. Cambridge, MA, MIT Press. *Not in bookstore - purchase online*

Source for many of the course tools & processes: Taylor, P. and J. Szteiter (2012) Taking Yourself Seriously: Processes of Research and Engagement, Arlington, MA: The Pumping Station (Available in hard copy from online retailers or as pdf from http://thepumpingstation.org)

- Online links duplicate pages in this text, but, if you buy the printed or pdf text, you can refer to that instead of reading the pages online and you have a reference work to consult after the course.

## Assessment and Requirements

REQUIREMENTS:

- For the different assignments and participation items take into account the guidelines supplied on the Notes wikipage.
- The central part of the course involves presentations and written assignments or "products" (which will average 800-1200 words) on 4 PBL cases. Participation requirements included active participation during class based on preparation between classes, meeting with the instructor on your assignments and projects, regularly adding an annotated reference to the evolving bibliography on the blog, and reporting on your inquiries in progress. It is expected that you will spend at least 6.5 hours per session outside class time reading, researching, and writing.
- The draft products are commented on, but not graded. You are expected to read comments carefully, consult with instructor if you don't understand a comment, revise thoughtfully in response to the comments, and resubmit. Not grading keeps the focus on interaction around written work and presentations that emerge from participation in the unfolding dynamics of the course.
- You should aim for 10 of 12 writing/presentation assignments submitted by the due dates as well as 32 of 38 participation items fulfilled. (Allowing a fraction of assignments to be skipped without penalty or explanation accommodates the contingencies of your lives.) If this 10 & 32 level is reached—and the goal is to work with everyone to achieve that—you get at least a B+ and a rubric is used to determine B+, A- or A. If you don't get to that level, the grade is based on points given for what has been completed (as described below).
- The course works by building from one PBL unit to the next so late submissions detract significantly from the learning process for the student in question and from the learning possibilities for the other students. Each student can ask for extensions--no explanation needed--on two assignments or participation items, moving the due date up to the last session. Beyond the 2 extensions, late submissions don't count; instead focus on doing the best you can with the remaining assignments and participation items.
- Use a personal copy of the checklist wikipage to keep a log of assignments and participation items completed. You keep track of due dates--do not expect class-time or meetings with the instructor to be used to remind you. Similarly, if you get behind, you take the initiative to submit a plan to catch up or reassure the instructors that you have, in light of your other commitments, chosen to take the grading consequences of missing assignments or due dates.

## Written products and presentations from PBL units (3/5 of grade)

A. Presentations for each PBL case to class and a panel of visitors (=4 assignments)
B. Draft product for each PBL case (800-1200 words, plus bibliography), due one week after the presentation by emailing to person on the list on peer share wikipage and to the instructor. (=4 assignments)
C. Product (800-1200 words, plus bibliography) posted to the blog after revision in response to plus-delta comments on presentation and to comments from an instructor and a peer; due 3 weeks after presentation (=4 assignments)

## Participation and contribution to the class process (2/5 of grade)

a. Building learning community through i) attendance and participation at class meetings based on

reading and preparation between meetings, and ii) inquiry and reading on the CE between sessions, with posting of annotated bibliography items (see C above) (=14 items).
b. Posting of question from the "syllabus treasure hunt (quiz)" before session 2.
c. Bibliography contributions with paragraph-length annotations, drawn from readings assigned or encountered during PBL units; 2 posted to blog during each unit (=8 items)
d. Notes or other assignments on inquiries pursued since the previous session, twice during each unit, posted to blog (=8 items)
e. Peer commentary emailed to the student, with cc to instructor, on draft product from PBL unit within a week of draft being emailed to you (=4 items)
f. Minimum of two in-office or phone conferences on your assignments and journal/workbook -- one by session 5; the other by session 10 (=2 items)
g. Submission in last session of filled-in copy of assignment checklist, including planned dates for any further submissions or completion contract if needed, and student's self-assessment on rubric below.
h. EXTRA-Participation in a Science in a Changing World workshop as part of the Cambridge Science Festival, late April.

**Overall course grade**
If 10 of 12 writing and presentation assignments are submitted by the due date as well as 32 participation items fulfilled, you get at least a B+ and the rubric below is used at the end of the course to add points to 80 for final grade. If you do not reach the level of the automatic B+ or above, then for each assignment submitted and for each presentation made 5 points are given (minus 1 point for each week or part thereof late), and 1 point for each participation item, up to a maximum of 80.
Minimum points for letter grade: A 95, A- 87.5, B+ 80, B 72.5, B- 65, C+ 57.5, C 50.

*Rubric:* For each quality "fulfilled very well" you get 2 additional points. If you "did an OK job, but there was room for more development/attention," you get 1 point.

- 1. A sequence of assignments paced more or less as in syllabus (including timely revisions),
- 2. often revised thoroughly and with new thinking in response to comments.
- 3. Projects innovative, well planned and carried out with considerable initiative, and
- 4. indicate that you can extend tools and processes from the course to your specific situation so as to engage with "political influences on the development of science and technology, and, reciprocally, ...influences of such developments on political processes and possibilities."
- 5. Written assignments clear and well structured,
- 6. with supporting references and detail, and professionally presented.
- Active, prepared participation and building class as learning community, including
    - 7. notes or other assignments posted on inquiries in progress
    - 8. prepared participation in class activities, incl. check-ins on readings and student-led activities for unit 4,
    - 9. comments on other students' presentations, drafts, and blog posts, and
    - 10. annotated bibliography entries and other contributions to exchanges on the blog.

ACCOMMODATIONS: Sections 504 and the Americans with Disabilities Act of 1990 offer guidelines for curriculum modifications and adaptations for students with documented disabilities. The student must present any adaptation recommendations to the professors within a reasonable period, preferably by the

end of the Drop/Add period.

CODE OF CONDUCT: The University's Student Code of Conduct (http://www.umb.edu/life_on_campus/policies/code) exists to maintain and protect an environment conducive to learning. It sets clear standards of respect for members of the University community and their property, as well as laying out the procedures for addressing unacceptable conduct. Students can expect faculty members and the Office of the Dean of Students to look after the welfare of the University community and, at the same time, to take an educational approach in which students violating the Code might learn from their mistakes and understand how their behavior affects others.

Students are advised to retain a copy of this syllabus in personal files for use when applying for certification, licensure, or transfer credit.

This syllabus is subject to change, but workload expectations will not be increased after the semester starts. (Version 13 Dec. '13)

## Sequence of Classes

Session-by-session links: 1/29, 2/5, 2/12, 2/19, 2/26, 3/5, 3/12, 3/26, 4/2, 4/9, 4/16, 4/23, 4/30, 5/7

**Session 1, 1/29, Connections and learning tools to make contributions to a topic**
***Preparation:***
Obtain required texts
Online students: Get set up on google+ for hangouts (instructions)
Face2face students: Bring laptop or tablet (if you have one) and activate connection to UMB wifi. (Ditto for sessions 2-5, 8, 10, 14).

***Session:***
1a. PBL and the rhythm of the course
1b. Very brief overview of the four cases that make up the course
1c. Carry over from one case to next, or beyond the course? —depends on experiences as well as tangible outcomes
2. Opening up questions, a 60-minute case:
Listen-pause-listen to audio recording of Iain Boal, "Climate, Globe, Capital"
What questions are raised for you--especially about the views of science and technology in relation to politics (and vice versa)? Use the internet to find out answers to at least some of the questions. Share a quick summary of your inquiry.
3. Refreshments & Getting to know people bingo, http://wp.me/p1gwfa-gS
4a. Reassurance: There will be a Focusing In phase next week after the Opening Up of this session and prep for session 2.
4b. First look at 4Rs (Taylor et al. 2011) and Probe-Connect-Create Change-Reflect frameworks for building a supportive community for learning.
4c. Walk through links needed for preparation for session 2, which includes:

- Syllabus Quiz
- Blog
- PBL Case 1
- KQ assignment on inquiries
- Check-in = 1-minute report on a reading

5. Critical Incident Questionnaire (submitted online at http://bit.ly/CIQ1e or on paper)

**Session 2, 2/5, Case 1. Generating questions for inquiry in PBL and in Science & Technology Studies (STS)**

***Preparation:***

Complete syllabus treasure hunt to acquaint yourself with, and raise questions about requirements, the blog, the PBL approach, and the syllabus in general, as well as sharing a personal profile.
Read Case 1, "Science-policy connections to improve responses to extreme climatic events: Briefings requested-quickly!"
Identify and post questions for inquiry = 1st participation item d for PBL Unit 1
(Optional: Begin that inquiry).
Reading: TBA (Taylor and Buttel, Yearley (from STS handbook), Glantz (overview))

***Session:***

1. Feedback on Critical Incident Questionnaire and follow-up to syllabus treasure hunt: questions about requirements, the blog, and the syllabus.
2. 1-minute check-ins on reading(s).
3. Discussion (using the 5-phase format) about getting oriented to the PBL approach in general and the case in particular, including findings or questions arising from any inquiry made since session 1.
4. Mini-lecture on "KAQ" (Knowledge claims-Actions that follow-Question for inquiry) framework for teasing out diverse inquiries and its relation to a pragmatic perspective in the field of Science & Technology Studies (STS).
5. Workshop on generating questions, inquiring into them, and preparing a work-in-progress presentation on the briefings required by case 1.

**Session 3, 2/12, Case 1 work-in-progress presentations**

***Preparation:***

Pursue inquiries.
Prepare work-in-progress presentation = 2nd participation item d for PBL Unit 1
Post 1st Bibliography contribution with paragraph-length annotation (if you haven't already = participation item c)
Reading: TBA (Sismondo)

***Session:***

1. Check-in on reading(s).
2. Work-in-progress presentations (10 minutes, including time for questions and plus-delta feedback)
3. Discussion (5-phase format) about the ways we can meet the "[national policy analysis] group's interest in making an informed and informative contribution to public discussion after the Durbin summit."

**Session 4, 2/19, Case 1 (completed). Presentation of briefings to members of the "National policy**

**analysis group"**

***Preparation:***

Continue inquiry
Prepare presentation on briefing
Post 2nd Bibliography contribution with paragraph-length annotation (if you haven't already = participation item c) *[this expectation won't be listed in future preparations]*
Reading: TBA (Yearley)

***Session:***

(No check-in on readings this session.)
1. Presentation on briefing for the panel, using an early draft of the briefing as appropriate
2. Discussion (5-phase format) about presentations, time permitting.

**Session 5, 2/26, History of U.S. science policy/politics: Mapping of intersecting processes**

***Preparation:***

Read Case 2, " The democratic control of science-A self-guided e-trail"
Follow the directions in the case to map of one chapter of Dickson's New Politics of Science or one chapter of Moore's Disrupting Science or Hess et al. "Science, Technology, and Social Movements," in Hackett et al., or Moore, "Powered by the People," in Frickel and Moore
Prepare, scan and post map = 1st participation item d for PBL Unit 2
Reading = TBA (one of the above & Clarke (2005) or other from Handbook)

***Session:***

1. Check-ins on reading(s).
2. Presentation of maps, preceded and followed by discussion (5-phase format)

**Session 6, 3/5, Rise and decline, hopes and outcomes of various citizen-level science and politics initiatives**

***Preparation:***

Ongoing inquiry into the case and post note on inquiries = 2nd participation item d for PBL Unit 2
Reading: TBA (Epstein from Handbook, Moore)
Prepare to bring one example of a citizen-level science and politics initiative into session 6 discussion.

***Session:***

1. Discussion (5-phase format) about how Moore (2006) illuminates examples of citizen-level science and politics initiatives.
2. Workshop

**Session 7, 3/12, Case 2 (completed). Presentation of e-trail guide to guests**

***Preparation:***

Prepare e-trails contribution and presentation
Notes on inquiries: from hereon, the topic and timing of these are student's choice, except that two posts are expected by the end of each unit
Reading: TBA

***Session:***

1. Presentations, with guest audience
2. Discussion (5-phase format) about presentations, time permitting.

**Session 8, 3/26, Comparisons: within Europe; within the U.S.A.; between them**

***Preparation:***
Read Case 3, "Research prospectus for collaboration with Europeans on comparative studies of infrastructure development around new genetic technologies"
Choose one case from Centro de Estudos Sociais (2005) and search for a parallel site of research or policy formation in the United States as it relates to infrastructure development (or lack thereof) around new genetic technologies.
Reading: TBA
***Session:***
1. Check-in
2. Mini-lecture
3. Discussion (5-phase format) about situations found for comparisons within and between regions.
4. Workshop

**Session 9, 4/2, Discussion about policy for infrastructure development around new genetic technologies.**
***Preparation:***
Ongoing inquiry into the case.
Prepare to bring one example of contrasting infrastructure policies into session 9 discussion.
Reading: TBA (Edwards or AGRE)
***Session:***
1. Check-in
2. Mini-lecture
3. Discussion (5-phase format)
4. Workshop

**Session 10, 4/9, Case 3 (completed). Presentation of research prospectus to panel of Europeans (by hangout)**
***Preparation:***
Prepare research prospectus and presentation.
***Session:***
(No check-in on readings)
1. Presentation on research prospectus
2. Discussion (5-phase format) about presentations, time permitting.

**Session 11, 4/16, Prepare and perhaps Practice "Education & civic engagement" units/activities**
***Preparation:***
Read Case 4, "Professors seek ideas about teaching units or public engagement activities that prepare students and citizens to be informed participants in political debates about science, technology, and social change," then begin work on that case.

- For CCT students these units/activities should be suitable for inclusion in the required Reflective Practitioner's Portfolio because the description of your unit or activities includes a reflection at the end that conveys the ways in which the unit or activity demonstrates your attention to the three broad goals of the course.

Prepare for in-session practice of "Education & civic engagement" units/activities
Reading: TBA
***Session:***
1. Check-in on readings
2. Discussion (5-phase format) about the scenario for Case 4.
3. In-session practice of "Education & civic engagement" unit/activity, if anyone has volunteered for this session.
4. Workshop to prepare "Education & civic engagement" units/activities and plan to make up blog entries

**Session 12, 4/23, Practice "Education & civic engagement" units/activities**
*Preparation:*
Presenters prepare for in-session practice of "Education & civic engagement" units/activities.
Other students prepare as requested by presenters in advance.
Reading: TBA
*Session:*
1. Check-in on readings
2. In-session practice of "Education & civic engagement" unit/activity
3. Closing circle reflection

**Session 13, 4/30, Practice "Education & civic engagement" units/activities**
As for session 12

**Extra session, Saturday in late April, 10-4 (or part thereof)**
Participation in a Science in a Changing World workshop as part of the Cambridge Science Festival (Participation item h: details)

**Session 14, 5/7, Taking stock of course: Where have we come & where do we go from here?**
*Preparation:*
Assignment checklist completed
Last week for blog posts for participation items c & d
Upload draft report on "Education & civic engagement" unit/activity
*Session:***
Retrospective look at initial blogposts on interests and goals for the course
Future Vision (Future ideal retrospective) about dual goals of learning about the subject and re-engaging with avid learning
Written evaluation that starts with a self-evaluation (to be administered by survey gizmo).
Closing circle

5/14 -- No session, but due date on peer comments on draft report on "Education & civic engagement" unit/activity and last date for overdue revisions of draft products (except for PBL Unit 4).

5/21 -- No session, but due date for revision of draft report on "Education & civic engagement" unit/activity

## COURSE READINGS

If the reading is not linked below, use the instructor-supplied password on this portal to access the readings. The list below includes references cited in the PBL cases, which are not necessarily the most recent or most comprehensive publications on the topics. Further readings will emerge during student inquiry on the cases and be shared on the blog.

Boal, I. (2009). "Climate, Globe, Capital: The Science and Politics of the Abyss." Scurvy Tunes.

Centro de Estudos Sociais (2005) Identifying Trends in European Medical Space: Contribution of European Social and Human Sciences. Coimbra, Portugal: Centro de Estudos Sociais.

Clarke, A. (2005). Situational Analysis: Grounded Theory after the Postmodern Turn. Thousand Oaks, CA: Sage

Dickson, D. (1984). The New Politics of Science. New York, Pantheon, reprinted University of Chicago Press, 1988.

Edwards, P. N. (2003). "Infrastructure and modernity: Force, time, and social organization in the history of sociotechnical systems." Modernity and Technology. T. J. Misa, P. Brey and A. Feenberg. Cambridge, MA, MIT Press: 185-225.

Frickel, S. and K. Moore (eds.) (2006). The new political sociology of science: institutions, networks, and power. Madison, WI, University of Madison, Wisconsin. (Available online via Ebrary)

Glantz, M. ed. (1989). Societal Responses to Regional Climactic Change: Forecasting by Analogy. Boulder, CO: Westview Press.

Hackett, E., O. Amsterdamska, et al., Eds. (2008). The Handbook of Science and Technology Studies. Cambridge, MA, MIT Press.

Hess, D., S. Breyman, et al. (2008). Science, Technology, and Social Movements. The Handbook of Science and Technology Studies. E. Hackett, O. Amsterdamska, M. Lynch and J. Wajcman (eds.) Cambridge, MA, MIT Press: 473-498.

Leopold, L. (2007). The Man Who Hated Work and Loved Labor: The Life and Times of Tony Mazzocchi. White River Junction, VT, Chelsea Green Publishing.

Moore, K. (2006). Powered By the People: Scientific Authority in Participatory Science. The New Political Sociology of Science: Organizations, Networks, and Institutions. S. Frickel and K. Moore (eds.) Madison, WI, University of Wisconsin Press: 299-323.

Moore, K. (2008). Disrupting Science: Social Movements, American Scientists, and the Politics of the Military, 1945-1975. Princeton, NJ, Princeton University Press.

Panofsky, A. (2011). "Generating sociability to drive science: Patient advocacy organizations and

genetics research." Social Studies of Science 41(1): 31-57.

Paul, D. (1998). The history of newborn phenylketonuria screening in the U.S. Final Report of the Task on Genetic Testing. Baltimore, Johns Hopkins University Press: 1-13. http://biotech.law.lsu.edu/research/fed/tfgt/appendix5.htm (viewed 14 Jan 2004)

Sclove, R. (1995). Democracy and Technology. New York, Guilford.

Taylor, P. J. (2009). "Infrastructure and Scaffolding: Interpretation and Change of Research Involving Human Genetic Information." Science as Culture 18(4): 435-459.

Taylor, P. J. (2010). Diagramming of Intersecting Processes (a teaching activity under development)

Taylor, P. J. and F. H. Buttel (1992). "How do we know we have global environmental problems? Science and the globalization of environmental discourse." Geoforum 23(3): 405-416.

Taylor, P. J., S. J. Fifield, C. Young (2011). "Cultivating Collaborators: Concepts and Questions Emerging Interactively From An Evolving, Interdisciplinary Workshop." Science as Culture 20(1): 89-105.

(See also 2005 syllabus and supplementary bibliography)

# Scientific and Political Change

# Notes on assignments

including guidelines for:

- written assignments/products & presentations
- participation and contribution to the class process

***It often helps students to have a printed version of assignment guidelines, but then to visit the actual wikipage,*** http://ppol749.wikispaces.umb.edu/Notes***, to follow live links.***
The course works by building from one PBL unit to the next so late submissions detract significantly from the learning process for the student in question and from the learning possibilities for the other students. Each student can ask for extensions--no explanation needed--on two assignments or participation items, moving the due date back as far as to the last session. The grading system also allows you to skip 2 assignments and 6 participation items altogether. Beyond the 2 extensions, late submissions don't count; instead focus on doing the best you can with the remaining assignments and participation items.
Version 13 Dec 2013

## Written products and presentations from PBL units (3/5 of grade)

*Specifications for the products and presentation are given in the description of the cases for the* PBL units
A. Presentations for each PBL case to class and a panel of visitors (=4 assignments, weeks 4, 7, 10 and 11, 12 or 13)
well-prepared, not informal or extemperaneous, 10 minutes followed by Plus-Delta feedback from everyone else (with online feedback collated by instructors and forwarded to speaker)

The idea of preparing a presentation is a) to move your inquiry on the case forward and, given that inquiry into any case usually opens an array of issues, b) to focus in towards a coherent product. When you prepare to give a presentation, when you hear yourselves speak your presentation, and when you get feedback, it usually leads to self-clarification of the overall argument underlying your inquiry which helps in completing or revising the written product, which is due one week later. It is assumed that the presentation incorporates work that has progressed given the standard expectation of 6-8 hours effort between sessions.

There may or may not be time for extensive discussion on each presentation, but you can learn from the rest of the group's feedback providing appreciations, suggestions, questions, contacts, and references. You can also learn from compare-contrast with the other students' W-I-P presentations.

Try to prepare visual aids for presentation without diverting your time away from your ongoing inquiry. (These days I use pdf's, not Powerpoint, for all my talks, in part because of bad experiences with some

images not showing up when ppt files got shown on a different operating system. But mostly because I can write and revise outlines in Microsoft Word and then when I'm ready, I change the font size, "print" as a pdf, and I'm ready to go live. I don't get distracted by animations, backgrounds, fade-ins and other non-essential features of a talk. Even if you don't take this tip, try to make one introductory slide that captures the overall structure and logic of your inquiry. This might be enough of a visual aid that you can talk to that slide and not have to prepare many others.)

You can show your visual aid using the Screenshare icon during a hangout. Face2face students and, as a backup, also students coming in from a distance, should upload their visual aid files in advance to non-public wikipage or email them to the instructor. Before screensharing or uploading, hide as many of the toolbars on your file as possible (using the options under View in the menu for the software used to create the file).

B. Draft product for each PBL case (800-1200 words, plus bibliography of references cited), due one week after the presentation by emailing to person on the list on peer share wikipage and to the instructor. (=4 assignments)

The expected product is specified in each PBL description, but you may take a lot of latitude in the exact form as long as it gives evidence of your learning a lot. You might also include material that conveys your process of development during the inquiry (how your current thinking about the case differs from how you understood it initially) and plans for the future inquiry and practice.

The product should not be directed to the instructor, but conceived as something helpful to readers like your student colleagues. The product should "GOSP" readers--Grab their attention, Orient them, and move through Steps so that they appreciate the Position you have led them to and how it matches the subject of your project. References should be complete and cited in a consistent format.

Proofread your work for spelling, grammar, punctuation, and coherence of paragraphs--Each paragraph should have one clear topic that is supported and/or developed by what is in it. If writing is difficult for you, arrange assistance from a fellow student or a professional editor -- do not expect the instructor to be your writing teacher.
Recommended:

- as guides to writing and revising: Peter Elbow, Writing with Power; Daniel, et al. Take Charge of Your Writing
- as a guide on technical matters of writing scholarly papers: Turabian, A Manual For Writers, or equivalent pocket guide.

Before uploading, rename your file so it begins with your initials. If there are problems in uploading, try another browser. If that fails, email it to the instructor, who will upload it.

C. Product (800-1200 words, plus bibliography of references cited) posted to the blog after revision in response to plus-delta comments on presentation and to comments from an instructor and a peer; due 3

weeks after presentation (=4 assignments)
In giving equal weight to the original submission and to the revision, the expectation is that there will be new thinking, which often requires additional inquiry, in response to comments. In posting the revised version to the blog, copy the product into the body of the post, not as an attached file.
The revised products will be available for future students to read on a password-protected, hidden-to-google wikipage. If you don't want a product to be made available, you must supply an abstract summarizing your report to be made available to future students instead.

## Participation and contribution to the class process (2/5 of grade)

a. Building learning community through attendance and participation at class meetings based on preparation between meetings, which requires inquiry and reading on the PBL between sessions (=14 items).
Punctual arrival and prepared participation in class sessions is expected. No taking cell phone calls. Online students should also make sure they are not distracted by members of the household, including pets.
Face2face students can join from a distance only if they have a special circumstance, e.g., illness, give good notice and get confirmation, and are set up properly to use the necessary technology.
*Make-up for missed classes:* Within 3 days of the session, view the youtube video for the session, post comments [i.e., what you would have said] on a passage from the start, middle, and end of the dialogue hour OR on each presentation, then undertake the activity and post a description of your experience and the results. Also, for presentations, present yours to an empty hangout on air and post a link to the resulting youtube recording. (Ask instructor for help with the technical side if you have problems.) If you can't do the make-up within 3 days of the session, note this as a missed participation item.

b. Posting of question from the Syllabus treasure hunt (quiz) before session 2.
To acquaint yourself with, and raise questions about requirements, the blog, the PBL approach, and the syllabus in general, as well as sharing a personal profile. This exercise makes you explore the syllabus, requirements, and on-line materials.

c. Bibliography contributions with paragraph-length annotations of readings either assigned or encountered during PBL units; 2 posted to blog during each unit (=8 items)
You choose which articles to annotate according to your interest in them (and, of course, their connection with the course). The aims of annotation are:

- a) to get you to digest the article sufficiently to explain the essence of it to others and its potential connections to your own interests/research; and
- b) to share the results with other students. (The annotations may be included in a wikipage made available to future students.)
    - Indeed, to decide what to write, think of these annotations as resources you are providing

for other students (current and future) who might not have time to read the article OR who might need stimulation/guidance about what they decide to make time to read.

d. Notes or other assignments on inquiries pursued since the previous session, twice during each PBL unit, posted to blog (=8 items)
Inquiry and reading on the PBL is expected between sessions. Early in the semester, specific exercises will be set in the PBL units and noted in the syllabus, with results to be posted on the blog. During the rest of the semester, post a paragraph or two update on your inquiry twice during the course of the PBL unit, spaced a week apart and not left to the date that the presentation is due. These postings may address the process of your inquiries as well as what you find out. You are encouraged to read and learn from each other's postings.

e. Peer commentary emailed to the student, with cc to instructor, on draft product from PBL unit within a week of it being emailed to you (=4 items)
Do a commentary only when you have uploaded your own product. The pairings or 3-way sharing of products will be organized by the instructor.
When you decide what approaches to commenting you ask for as a writer or what approaches you use as a commentator, keep Elbow and Belanoff's (2000) variety of responses in mind. (Elbow 1981, chapters 3 and 13 on sharing and feedback is relevant here as well.) After all, although some commentators (advisors/instructors/editors) fill the margins with specific suggestions for clarification and changes, the response of students to the suggestions often goes no further than touching up—the desired re-thinking and revising of ideas and writing rarely happen. It seems a better use of an commentator's time to capture where the writer was taking you and make a few suggestions that might clarify and extend the impact on readers of what was written. As writers, we all value comments that show us that we have been listened to and our voice, however tentative, has been heard.

f. Minimum of two in-office or phone conferences on your assignments and journal/workbook -- one by session 5; the other by session 10 (=2 items)
for discussion of comments on assignments (see Dialogue around written work), ideas for PBL inquiries, and the course as a whole. They are important to ensure timely resolution of misunderstandings and to get a recharge if you get behind. Appointments missed without notifying instructor in advance count as a participation item not fulfilled.

g. Submission in last session of filled-in copy of assignment checklist, including planned dates for any further submissions or completion contract if needed, and student's self-assessment on rubric included in the checklist.
by keeping track yourself time in class and in meetings with the instructor do not have to be spent on reminding students of what's to be submitted and comparing notes on what has been done.

h. EXTRA-Participation in a Science in a Changing World workshop as part of the Cambridge Science Festival, Saturday morning or afternoon in late April.
details will be provided in due course