

PPHA 41210: Science & Technology for Future Policy Wonks - Update

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Course description and prerequisites:

This course is aimed at delving into science and technology topics that are relevant to policy, and to understand how knowing more (or better) about the technical issues could potentially and ultimately drive more sensible policy decisions. A key component of this course is learning how to develop a research-based extended memorandum that promotes specific policy directions on issues related to technology/science issues, and then to learn how to craft a succinct 10 minute presentation (perhaps aimed at a member of Congress or his/her staff) summarizing the key point(s). Thus, this course is most definitely **not** intended to be a remedial science course for folks interested in policy ...

As for prerequisites, my own take is that *interest* is the key requirement, and my impression has been that, given the rigorous foundational course structure of the first year graduate program, any Harris student taking that course sequence will be more than prepared to deal with the material that I will be presenting. And it goes without saying that we will be dealing with topics that do involve (really, require) quantitative analyses – but we will not be solving (for example) differential equations.

How the course will be run:

The course will be run as a mixed lecture/practicum: It will meet once a week, on Tuesday mornings starting at 8:00 am. The class will be divided into groups of 3-4 students, each group focused on a particular topic involving the intersection of science, technology and policy. (Examples include the prospects of large-scale carbon dioxide removal from the atmosphere, the future of electrification of heavy-duty truck using batteries or hydrogen fuel cells, solar geoengineering, and the future of nuclear small modular reactors and microreactors, ...; I will provide a list of well over 10 potential topics on our first meeting – and am willing to entertain suggestions!) Each group will be charged with (i) producing a final paper summarizing their work as well as (ii) a final 15 minute group presentation; both the topical papers and the group presentations will be graded (and weighted equally). The combined grade for the topical paper and the group presentation will be the course grade for all participants in a given topical group. We will set up all of the groups on the first day of class.

The first hour of each class meeting will be devoted to lectures, given mostly by myself, but occasionally also by guest lecturers who are expert in various areas of energy and climate science, engineering and policy. The second part of each class meeting will be focused on the group work; I will be circulating among each of the groups for discussion and consultation.

Schedules:

The first class will be held on Tuesday, October 1, starting at 8:00 am.

Text(s):

There are no required texts! I do recommend – to those of you who likely to have a continuing interest in the links between technology and policy – a few books that I can strongly recommend: The primary example is Richard A. Muller, *Physics and Technology for Future Presidents: An Introduction to the Essential Physics Every World Leader Needs to Know* (Princeton U. Press).

This book is available on Amazon, where usually the best prices reign. It's an expanded version of two other (older) books, one of which (*Physics for Future Presidents*) has been available as a paperback for well over a decade. I don't recommend the earlier versions, as they contain substantially less material, and were not designed as textbooks (thus, for one thing, they are far less quantitative ...). I will regularly also refer to another text, David JC MacKay's *Sustainable Energy – Without the Hot Air* (UIT Cambridge Ltd.). This is a free (!) book, available as a downloadable pdf file on MacKay's web site www.withouthotair.com. It has a lot of very useful (quantitative) information and is a very nice complement to Muller's text. A commercial (hard copy) version also exists; its principal advantage is that it is nicely packaged – its principal disadvantages are that it costs \$\$ and that – while the on-line version is constantly updated – the commercial version is not!

Course Website:

The course website is hosted on the university's *Canvas* system, at <http://canvas.uchicago.edu>. All relevant materials will be posted on *Canvas*.

Homework, Exams, Papers, Grading:

There will be no exams and no homework assignments, but I do expect (a) weekly progress reports from each of the working groups and (b) regular attendance at all of the class meetings. The final grade will be determined by a combination grade for the final quarter paper and the final oral presentation produced by each of the working groups. Because the grading is done at the group level and because much of the work will be done in class, we will be monitoring attendance to assure that the groups' work load is (roughly) equitably distributed among group participants.

The final paper will be due at the end (= the last day) of exam period, while the 15 minute oral presentation (10 minute presentation, 5 minute question period) will take place during exam period (during the day and time slot assigned by the Registrar). In order to make sure that all the groups stay on track during the quarter, I will (in addition to the weekly progress reports) ask for a *draft* versions of both the final paper and the oral presentation at the beginning of the next-to-last class week of the quarter.

Office Hours:

I plan to schedule one office hour per week, taking place on Mondays at 8:00pm on Zoom; I will post the Zoom link on the first day of class (and on *Canvas*). I will also be available by appointment – just contact me in class, or by email, to arrange an in-person meeting.

The Web:

I strongly suspect that all of you are quite conversant with the Web, and if you're not, you surely will be after taking this course. The Web is an amazing source of both information and mis- (and dis-) information; and one of the things you will be paying much attention to is how to distinguish these data characteristics ...

The Honor System:

We function on the honor system. This means that you are on your honor to hand in work that is your own – in this course, this of course does not mean that I discourage studying, learning, and working with your fellow students – quite the contrary! What I do frown upon is such things such as copying material from other folks – and I include here using AI tools such as ChatGPT without

attribution. Thus, I view unattributed use of information – regardless of their source – as just plain cheating.

ADA student accommodations:

Any student who believes they may need assistance should inform the Office of Student Disability Services by the end of the first week of class. Once you have received an accommodation letter, it should be presented to the course instructor (i.e., me!) immediately. For details, see <https://disabilities.uchicago.edu/>