

# PPHA 41210: Science & Technology for Future Policy Wonks

Prof. Robert Rosner

Spring Quarter 2024

## Prerequisites for this course:

Interest! 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. It is most definitely **not** intended to be a remedial science course for folks interested in policy ...

My own take about Harris students is that, given the rigorous foundational course structure of the first year graduate program, anyone 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 Thursday afternoon at 2:00pm. 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 over 10 potential topics on our first meeting – and am willing to entertain suggestions!) Each group will be charged with producing a final paper summarizing their work; each of these topical papers will be graded, and that grade 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 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 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 Thursday, March 21.

## Text(s):

The primary reference 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 over a decade. I don't recommend the earlier versions, as they contain substantially less material, and were not designed as textbooks (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](http://www.withouthotair.com). It has a lot of very useful (quantitative) information and is a very nice complement to Muller's text. A commercial version also exists; its principal advantage is that it is nicely packaged – its principal disadvantages are that it costs \$\$; its principal disadvantage is that the on-line version is constantly updated, while 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, but I expect weekly progress reports from each of the working groups. The final grade will be determined by the final quarter paper produced by each of the working groups, due at the end (= the last day) of exam period.

### 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 by email to arrange an in-person meeting.

### An Additional Useful Fact:

Ms. Lydia Veliko ([lydiav@uchicago.edu](mailto:lydiav@uchicago.edu)) usually knows where I can be found if you're having trouble contacting me. (Caution: please do not contact Ms. Veliko regarding details of this course, as this is not part of her job!)

### 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-information; and one of the things you will be paying much attention to is how to distinguish these two 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. This does not mean that we discourage studying and learning with fellow students – quite the contrary! What we do frown upon is such things as copying your friend's homework just before class, and 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/>