Preliminary Course Syllabus for Physics 3200
Physics and Public Policy

Note: This syllabus, schedule and assignments are still subject to slight changes before the start of the semester.

Class meeting times: Tuesdays and Thursdays (1:00-2:15 pm) at SPL 48
Requirements fulfilled: SO (Social Sciences) or WR (Writing)

Instructor:
Bárbara Cruvinel Santiago (barbara.santiago@yale.edu)
Lecturer, Department of Physics /John B. Madden Dean of Berkeley College

To schedule meetings with me, please make sure to copy my assistant, Allison Van Rhee (allison.vanrhee@yale.edu) in any emails.

Office hours will be shared at the beginning of the fall semester.

Teaching Fellows:
Names will be listed here once TAs are assigned to the class.

Course Format and Ground Rules: While this course is lecture-based, active student participation is encouraged, and attendance is mandatory. Some topics in the course have political undertones, and we expect any discussions to be carried out in a respectful manner.

Attendance Policy: Attendance is mandatory, and you can have up to 3 unexcused absences without any impact to your grade. In extraordinary circumstances, more absences may be excused or made-up through some alternative arrangement. Please note that dean's extensions cannot cover absences by Yale College regulations. If you have to miss more than 3 classes, please e-mail the instructor and let her know the reason for the absence.

Course Description: Science is driven by innovation and discovery yet subject to the constraints of government, the public, and policy. This lecture course is designed to give students an overview of how the physical sciences and policy intersect. Topics to be explored include the players in crafting science policy in Congress, at the state level, in industry, in academia, and the public. While most case studies will center around US policymaking, we will also cover a few global policy topics. Ultimately, we hope this

course will give students the tools to understand how science policy works broadly, whether they want to work on it as an insider or to be citizen advocates.

This course will sometimes feature guest lecturers.

While in-depth knowledge of physics and math is not required to succeed in the course, some basic understanding might be helpful for specific case studies, particularly towards the end of the term. Physics topics will be introduced as needed. Please contact the instructor if you have questions about this.

If you have questions about whether this course will count towards a major requirement, please contact your major's Director of Undergraduate Studies directly.

Textbook and Readings: The course will use the book *"Beyond Sputnik: US Science Policy in the Twenty-First Century"* to be coupled with select readings about science policy topics that will be posted on the course's Canvas page.

Assignments: The assignments are split as listed below.

- **Advocacy one-pager and mock lobbying session**

Each student will write an advocacy one-pager in a format typically used in congressional lobbying meetings. We will have a mock lobbying session in which the instructor will pretend to be a congressional staff member, and the students will try to convince her to act on different science policy topics. Instructions on how to write a one-pager and on the logistics of the mock session will also be posted and discussed in class ahead of time.

- **Policy memo**

There will be one 4-page policy memo assigned during the semester. They will be on approved topics in relevant science policy format. For example, a memo could mimic a brief as it would be written by a Congressional Science staffer to his/her Congressperson analyzing a policy issue and making a policy recommendation. Instructions on how to write the memos will be posted ahead of time.

- **Advocacy Op-Ed**

Translating science to layman's terms is essential in advocacy for policy issues. Op-eds play a crucial role in targeting public opinion and policy stakeholders. One of the course's assignments is to write an 800-to-1000-word op-ed on a science policy issue of your choice. Further instructions and constraints will be shared later in the term.

- **Research paper and presentation**

Each student will write a 6-to-8-page research paper on a science policy topic of their choice and give a brief presentation on it towards the end of the term. More information

about suggestions and constraints on paper topics will be posted later in the semester.

Grading Policy: Grading will be based on attendance/participation (10%), the one-pager and mock lobbying session (10%), the policy memo (25%), the op-ed (20%), and the research paper and presentation (35%). Late assignments will have a 5% penalty for every day they are late unless arrangements have been made in advance.

AI policy: Students are welcome to use AI tools such as Chat GPT to brainstorm text for writing assignments, but all work and research should be ultimately the student's own work.

Writing Resources: If you have questions about how to go about the different writing assignments for this class, you should feel free to connect with the instructor and the TAs. We also highly recommend that you make use of resources in the Poorvu Center's Writing Center, such as writing partners and drop-in hours.

Accessibility: If you have accessibility needs to succeed in this course, make sure to contact Student Accessibility Services (SAS). Please also reach out to the instructor and/or your residential college dean if you have questions on how to get connected.

Preliminary Class Schedule

Please note that the pace of the class and the list of readings can be adjusted throughout the semester as needed. Please pay attention to course announcements over email and on the Canvas page.

Date	Readings/HW	Concepts	Guest Speakers (TBA in the Fall)
Section 1: Overview of US Science Policy			
28-Aug	Chapter 1	Course overview. What is science policy? Topics in science policy.	
2-Sep	Chapters 2 and 3	Who gets to make science policy in the US?	
4-Sep	Chapter 4	The budget process	
9-Sep	Chapter 5 + Readings TBD	Federal research funding and current funding topics. The special case of funding for nuclear weapons in the US	
11-Sep	Chapters 13 and 14 + Readings TBD	Infrastructure and Ethics	

16-Sep	Readings TBD	Lobbying. How to write one-pagers and memos.	
Section 2: Federal Partners in the Conduct of Science			
18-Sep	Chapter 7	National labs and their nuclear weapon origins	
19-Sep	**Lobbying one-pager due by 11:59 pm**		
23-Sep	Chapter 6 + ICAN Schools of Mass Destruction Report	Universities	
25-Sep	Chapter 8 + Readings TBD	Industry and quantum information	
30-Sep	Chapter 9 + Readings TBD	The states and local policy	
2-Oct	Chapter 10 + Readings TBD	Mobilizing the public	
7-Oct	Readings TBD	Professional organizations. Review/catch up for this section	
9-Oct		Lobbying mock session	
10-Oct	**Policy Memo due by 11:59 pm**		
14-Oct		Lobbying mock session	
Section 3: Further topics and case studies in physics-related policy			
21-Oct	Chapter 12 + Readings TBD	Big science and large experiments	
23-Oct	Chapters 15 and 16	STEM education and workforce	
28-Oct	Readings TBD	Workforce continued (demographics)	
30-Oct	Chapter 11 + Readings TBD	National defense, nuclear research nuclear weapons in the US and abroad -- Part 1	
4-Nov		National defense, nuclear research nuclear weapons in the US and abroad -- Part 2	
6-Nov	Chapters 17 and 18 + Readings TBD	Global science policy and international collaborations	
11-Nov	Readings TBD	Environmental policy	
13-Nov	Readings TBD	Satellite constellations and impact on astronomy	
14-Nov	**Op-Ed due by 11:59 pm**		
18-Nov	Chapters 19 and 20	Future challenges and other topics in science policy	
20-Nov		Review/catch up, first few presentations	

2-Dec		presentations	
4-Dec		presentations	
5-Dec	**Research paper due by 11:59 pm**		