Researchers, policymakers, and the American public look to science and technology to address some of society’s most pressing challenges, from climate change to public health to economic growth. But such efforts are the subject of controversy and concern. Think of fears that automation will create mass unemployment, that biotechnology threatens human health and natural biodiversity, or that human genome editing will reignite eugenic policies. This course examines the competing values that shape debates over how and when science and technology provide social benefits. Its goals are 1) to equip students with the interdisciplinary skills necessary to advocate for socially responsible science and technology policy; and 2) to provide concepts and tools for reasoning and writing about the normative challenges that shape a variety of policy challenges, both within and beyond science and technology.

Students who take this course will learn:

• The role of science and technology in American democracy, including the S&T policy landscape in the United States
• How to analyze the complex relationships between innovation, society, and public policy
• Key ethical concepts relevant to S&T policy, including utility, liberty, justice, and democratic deliberation
• How S&T policy can be used to help solve social problems, and how unreflective policy can exacerbate or lead to new problems
• How to integrate ethical considerations into policy analysis
• How to think and write in a sophisticated and reflective manner about value-based disputes in policy.

This course fulfills the Ford School Values & Ethics requirement. No scientific, technical, or ethics background is necessary.

**COURSE REQUIREMENTS**

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A. **Class participation.** This is a discussion-intensive course. Preparation, attendance, and active participation are mandatory and will be important parts of your final grade. Each class session includes discussions and activities that require that you have read the day’s assigned readings. Your preparation for class should not be a passive process of absorbing facts from readings; rather, while reading, you should actively identify (and write down!) questions you have, possible avenues of discussion, and potential points of application of the readings to current events.

B. **Class Discussion Board.** To assist you in fulfilling (A), during the course of the semester you will post on the class discussion board in advance of each class meeting. Discussion board posts are designed to facilitate in-class discussion of the readings. They will be graded on a check minus (1 point), check (2 point), check plus (3 point) basis, with the expectation that most posts receive a check. Posts should demonstrate that you carefully read and thought about the assigned text(s).

**Tuesdays:** On Tuesdays, students will respond with posts to a prompt, which Prof. Rohde will post by the previous Thursday at 5 pm. These should be 200-300 words and must be posted by **12 pm Tuesday.** The discussion posts and comments should not simply summarize the reading. They are think pieces—opportunities for you to refine questions and insights from the readings. Your entries should reflect holistically on the readings assigned for the day, not just one piece if more than one is assigned. Treat these posts as formal pieces of writing. Be clear and succinct.

**Thursdays:** On Thursdays, each student will **post 2 discussion questions by 12 pm.** Incorporating specific references to the text(s), including quotations, is highly recommended. Each question should represent one of the following types:

1. Clarification/Comprehension (e.g., What does X mean?)
2. Analytical/Interpretive (e.g., How does X evidence relate to Y point?)
3. Synthetic/Evaluative (e.g., Are you convinced by the author’s argument that X)
4. Connective/Comparative (e.g. How does X’s argument compare to Y’s from last week?)
5. Provocative/Argumentative (e.g., Doesn’t evidence X undermine the author’s point Y?!)
6. Applied/Extended (e.g. What light does X point shed upon current problem Y?)

C. **Written Assignments:**

1. **Research Funding Written Testimony:** Following our in-class debate about research funding policy, your team will write up your formal Congressional testimony. This assignment assesses your understanding of the research policy landscape and the different value-based orientations that underlie controversies over research funding in the United States. Your grade will also reflect your team’s evaluation of your individual and collective efforts.

2. **Science or Technology Policy Controversy Papers**
   a) **Topic Choice.** Choose an ongoing controversy related to a specific science or technology policy that you want to focus on for your last two papers. There are a variety of possibilities to choose from, but it is very important that you choose a current, specific controversy that is being actively discussed by stakeholders and/or policy officials. Controversies are likely to focus on one of two questions: 1) should
an area of science or technology move forward (e.g., proposals for developments pertaining to synthetic biology, geoengineering, natural resource development, etc.); or 2) should we regulate a particular area of science and technology (e.g., greenhouse gases/fossil fuels, genetically modified organisms, genetic testing). Choose a local, state, or national context in which an actual controversy is taking place. Answer the following questions: What are the main issues animating the controversy? What, if any, is the history of the controversy (briefly)? What is the evidence of a live, ongoing controversy? Who are the stakeholders involved? Identify at least three sets of stakeholders. Who are the decision-makers (the policymakers) involved? List the key ones. Who are the experts involved? Identify expert organizations, disciplines, etc. whose expertise is valuable to solving the policy problem. Answer: Why is this controversy of interest to you in the context of this course? Is any specific policy or legislation being debated?

b) **Backgrounder.** This paper should provide an analytic explanation of the values and key players that animate your controversy. This paper should be no more than 1000 words.

c) **Governance Recommendation.** For this paper, you will choose one or more of the approaches designed to resolve science and technology policy controversies that you think is/are best suited to help address or resolve your policy controversy. You will write a memo to a decision-maker involved in the controversy (i.e. someone who would be in a position to implement your proposal) that: 1) explains why your approach is the best means to address your controversy; and 2) provides a blueprint for implementing your approach. This paper should be no more than 1200 words.

**COURSE POLICIES**

1. **Attendance:** Because this course depends heavily upon discussion and in-class scenarios, I expect students to make every effort to attend all class sessions. **Please notify me in advance if you will miss class;** excused absences can be granted for things like illness and family emergencies, but only if I hear from you in advance. Any unexplained absences will negatively affect your grade. So will repeated tardiness; I expect you to arrive on time. Please also refrain from going in and out of the room during class.

2. **Late assignments:** Extensions require arrangements with the instructor made well in advance of the due date. Late assignments will lose **five points for each 12 hour period**, or fraction thereof, that they are late.

3. **Academic honesty:** All students are expected to abide by the University’s standards of academic honesty, integrity, and professionalism. For details, see [http://www.rackham.umich.edu/policies/academic_and_professional_integrity/](http://www.rackham.umich.edu/policies/academic_and_professional_integrity/).

4. **Electronic devices:** **Laptops and other devices are NOT allowed in class.** While I recognize that this may cause consternation, such technologies negatively impact the character and quality of class discussion. Because discussion is so important to the intellectual task we face, the costs of laptops outweigh the benefits. Out of respect to the instructor and your fellow students, **put your cell phone away for the duration of class.**
5. **Syllabus:** Because many topics we cover are subjects of ongoing discussion, I may make occasional changes to the course readings over the semester. I will always notify you in advance of any changes.

**FORD SCHOOL AND UM POLICIES**

**Inclusivity at the Ford School:** Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value one another’s opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community.

**Academic Integrity:** The Ford School academic community, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. We hold all members of our community to high standards of scholarship and integrity. To accomplish its mission of providing an optimal educational environment and developing leaders of society, the Ford School promotes the assumption of personal responsibility and integrity and prohibits all forms of academic dishonesty, plagiarism and misconduct. Academic dishonesty may be understood as any action or attempted action that may result in creating an unfair academic advantage for oneself or an unfair academic advantage or disadvantage for any other member or members of the academic community. Plagiarism involves representing the words, ideas, or work of others as one’s own in writing or presentations, and failing to give full and proper credit to the original source. Conduct, without regard to motive, that violates the academic integrity and ethical standards will result in serious consequences and disciplinary action.

Additional information regarding academic dishonesty, plagiarism and misconduct and their consequences is available at: [http://www.rackham.umich.edu/current-students/policies/academic-policies...](http://www.rackham.umich.edu/current-students/policies/academic-policies...)

**Accommodations for Students with Disabilities:** If you believe you need an accommodation for a disability, the University's Services for Students with Disabilities office (SSD) can be a valuable resource with which to start. In addition, if you believe you need an accommodation for a disability in any of your courses, please let the course instructor know at your earliest convenience. You need to allow sufficient time for your faculty member to respond, minimally 7 days, preferably more, in advance of when the accommodation is needed. Some aspects of courses may be modified to facilitate your participation and progress. As soon as you make your instructor aware of your needs, they can work with Student & Academic Services and/or the SSD...
office to help determine appropriate academic accommodations. Any information you provide will be treated as private and confidential.

**Student Mental Health and Wellbeing:** The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students’ academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) and/or University Health Service (UHS). For a listing of other mental health resources available on and off campus, visit: [http://umich.edu/~mhealth/](http://umich.edu/~mhealth/).

**COURSE READINGS**

All readings are available on Canvas.

**I. Thinking Critically about Science, Technology, and Values**

**Thurs., Jan. 10:** Introduction and Overview

**Tues., Jan. 15:** Technology and Values


**Thurs., Jan. 17:** Who (or What) Constructs Technology?

**Tues., Jan. 22:** Science and Values

**Thurs., Jan. 24:** Gender, Race, and Science


**II. Rethinking Research Policy for the Public Good**

**Thurs., Jan. 29:** Origins of U.S. Research Policy

**Thurs., Jan. 31: Contemporary Research Policy**

**Tues., Feb. 5: Ethics Interlude: Dignity in Numbers?**

**Thurs., Feb. 7: Patents for Public Good?**

**Tues., Feb. 12: Connecting Policy and Public Values**


In Class Debate!

**III. The Politics of Knowledge**

**Thurs., Feb. 21: Who is “The Public”?**

Written Testimony due Fri. Feb. 22 at 8 pm

Tues., Feb. 26: Public Health and Personal Liberty
Laura Hirschfield, “Vaccine Hesitancy,” *Seattle’s Child*.

Thurs. Feb. 28: Who Counts as an Expert?

Tues., Mar. 12: Identity, Experience, and Expertise

Thurs., Mar. 14: Justice and Dignity in the Digital Age I: Facial Recognition Technology

*March 17, 8pm: Controversy Papers Topic Choice due!*

Tues., Mar. 19: Justice and Dignity in the Digital Age II: Algorithmic Governance

IV. Rethinking S&T Governance

Tues., Mar. 26: Policymaking in the Age of Postnormal Science

Thurs., Mar. 28: Water Security and Democratization: PFAS in Ann Arbor
EPA, “Basic Information on PFAS.” Link: [https://www.epa.gov/pfas/basic-information-pfas](https://www.epa.gov/pfas/basic-information-pfas)

Tues., Apr. 2: Governing Biotechnology I: GMOs

Thurs., Apr. 4: NO CLASS

**April 7, 8 pm: Controversy Backgrounder Due!**

Tues, Apr. 9: Governing Autonomous Vehicles

Thurs., Apr. 11: Governing Biotechnology II: CRISPR

Tues., Apr. 16: Governing Autonomous Vehicles II

Thurs., Apr. 18: Responsible Innovation

Tues., Apr. 23: Moral Responsibility in an Age of Autonomous Weapons

April 26, 8pm: Governance Recommendation Due!