
PHIL 3127: SCIENCE, TECHNOLOGY & HUMAN VALUES

Lecture:	PTB 109	Monday & Wednesday	9:30 – 10:20 AM
Seminar:	Skiles	Friday	Various Times

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Office Hours: Wed, 14:00–15:30 DM Smith 009

TEACHING ASSISTANTS

TBD

COURSE DESCRIPTION

Science is a human endeavor—a process for generating knowledge, innovating technologies, and refining skills. Guiding this process are values: principles or standards for evaluating human conduct and its outcomes. Some of these values are *epistemic*—that is, pertaining to knowledge, or true beliefs. After all, scientific activity is largely oriented at getting at the truth. But it is also true that science is guided by *non-epistemic* values from domains like aesthetics or morality. In fact, scientific work is shot through with non-epistemic value judgements: "how should one set the error threshold?", "should this result be published?", "should this idea *even be pursued?*". These aren't questions that can be guided by epistemic values alone.

This course is an introduction to issues that arise at the intersection of scientific conduct, human values, and technological innovations. It will introduce you to, and question, core principles guiding contemporary science and scientific practice (like the "precautionary principle"), deep and longstanding concerns (the "dual-use dilemma"), and new and arising concerns (connections between science and industry, growing concerns around "big data" and machine learning).

TEXTS

All readings will be made available through Canvas and Perusall. Optional texts that complement this course include:

Elliott, Kevin C. 2022. *Values in Science*. ([GATech Library](#))

Sandel, Michael J. 2009. *Justice: What's the Right Thing to Do?* ([GATech Library](#))

Shamoo, Adil E and David B Resnik. 2015. *Responsible conduct of research*. ([GATech Library](#))

LEARNING OBJECTIVES

There are three central aims of this course: (1) to introduce you to a range of ethical and epistemological issues in scientific practice; (2) to develop skills of critical thinking that will aid you in identifying principles, concepts, and arguments and subjecting them to analysis and appraisal, and; (3) to develop skills of moral reflection that will aid you in applying ethical ideas, identifying stakeholders, and considering (policy) implications.

The class will pursue these aims via the following learning objectives, which are linked to your assessment and evaluation:

- L1.** To gain knowledge and facility in select topics of scientific ethics, using this knowledge to describe, analyze, and explain current scientific practice and identify the implications of both possible and actual policies.

- L2.** To develop skills of argument analysis: learning to identify arguments, concepts, and distinctions in both scholarly and non-scholarly texts, and displaying such skills in useful and insightful interventions both in seminars and online.
- L3.** To foster skills of critical writing that engages with philosophical ideas, displaying such skills in writing that critically evaluates principles, concepts, and distinctions, and which employs reasons and inferences to support its claims and arguments.
- L4.** To develop verbal communication skills that support critical discussion by providing substantive contributions both in seminars and online and by "stepping-forward and stepping-back" in classroom discussions.

COURSE FORMAT

This course is organized into two distinct sections. On Mondays and Wednesday there will be in-person lectures (in PTB 109). These lectures will introduce you to philosophical issues in epistemology and ethics on specific topics.

On Fridays you will be meeting in smaller, 30-person seminars. These will focus on analyzing specific case studies: identifying stakeholders, applying ethical principles, and debating policies. These will be led by one of two teaching assistants.

COURSE SCHEDULE

Week	Date	Topic	Activities	Readings
1	1.9	Introduction		
	1.11	Ethics in Science		Shamoo, Adil E and David B Resnik. "Ethical Decision Making"
	1.13	NO SEMINAR		
2	1.16	NO CLASS		
	1.18	Scientists as Moral Agents		Douglas Heather. "The Moral Terrain of Science." Rotblat, Joseph. "A Hippocratic Oath for Scientists."
	1.20		Seminar	The Baltimore Case A timeline of events: "The Baltimore Case" (link) Overview: Hull, David. "Scientists Behaving Badly." (If you have read the Kevles piece, focus on §4.) Deep Dive: Kevles, Daniel J. "The Assault on David Baltimore."
3	1.23	Falsification, Fabrication, Plagiarism		Goodstein, Daniel. "Scientific Fraud." Activity: Follow through on one of the story lines on The Lab (link) <i>Recommended:</i> Schachman, Howard K. "What Is Misconduct in Science?"
	1.25	The Little Murders of Everyday Science		Zigmond, Michael J and Beth A Fischer. "Beyond fabrication and plagiarism: The little murders of everyday science." Aschwandan, Christie. 2015. "Science Isn't Broken: It's just a hell of a lot harder than we gave it credit for."

	1.27		Seminar	<p style="text-align: center;">Spidergate</p> <p>Overview: Kozlov, Max. "How a scandal in spider biology upended researchers' lives."</p> <p>Deep Dive (from the POV of a journal editor): Dan Bolnick. 17 Months. (link)</p> <p>Deep Dive (from the initial whistleblower): Kate Laskowski. What to do when you don't trust your data anymore. (link)</p>
4	1.30	Objectivity and Value-Freedom (Part I)		<p>Douglas, Heather. "Inductive Risk and Values in Science." <i>Recommended</i></p> <p>Elliott, Kevin C. <i>Values in Science</i>. (§§1–3; but focus attention on §3)</p>
	2.1	Objectivity and Value-Freedom (Part II)		<p>Betz, Gregor. "In defence of the value-free ideal." <i>Recommended:</i></p> <p>Lusk, G. "Does democracy require value-neutral science? Analyzing the legitimacy of scientific information in the political sphere." Elliott, Kevin C. <i>Values in Science</i>. (§§4–6; focus attention on §§4–5)</p>
	2.3		Seminar	<p style="text-align: center;">Scientists as Sentinels?</p> <p>Overview: Beckwith, John and Franklin Huang. "Should we make a fuss? A case for social responsibility."</p> <p>Deep Dive: [Video] Naomi Oreskes. Scientists as Sentinels (link)</p>
5	2.6	Scientific Freedom and Dual-Use Dilemmas		<p>Forge, John. "A Note on the Definition of "Dual Use"." <i>Recommended:</i></p> <p>Wilholt, Torsten. "Scientific freedom: its grounds and their limitations."</p>
	2.8	Publication Ethics (Authorship, Credit, and Responsibility)		<p>Lewontin, Richard. "Dishonesty In Science." Gelman, Andrew. "A garland of retractions for the Ohio State Department of Chutzpah Cancer Biology and Genetics." (link) <i>Recommended:</i></p> <p>Winsberg, Eric, Bryce Heubner, and Rebecca Kukla. "Accountability and values in radically collaborative research." Wennerås, Christine and Agnes Wold. 1997. "Nepotism and sexism in peer-review." Jaffe, Sam. "No Pardon for Poor English in Science."</p>
	2.10		Seminar	<p style="text-align: center;">Gain of Function Research</p> <p>Overview: Duprex, W Paul, Ron A M Fouchier, Michael J Imperiale, Marc Lipsitch, and David A Relman. "Gain-of-function experiments: time for a real debate." Deep Dive: Resnik, David B. "H5N1 Avian Flu Research and the Ethics of Knowledge."</p>
6	2.13	Writing Essays Overview & Question Period		
	2.15	Exam		
	2.17	NO SEMINAR		

7	2.20	Norms of Communication & Communicating with the Public		Figdor, Carrie. "(When) Is Science Reporting Ethical? The Case for Recognizing Shared Epistemic Responsibility in Science Journalism." Medvecky, Fabien and Joan Leach. 2017. "The ethics of science communication."
	2.22	Open Science & Science Journalism		Sprain, Leah. "Framing Science for Democratic Engagement." <i>Recommended:</i> Leonelli, Sabina. "Open Science and Epistemic Diversity: Friends or Foes?"
	2.24		Seminar	Transparency and the Risk of Communication Overview 1: Lindenmayer, David and Ben Scheele. "Do not publish." Overview 2: Lewandowsky, Stephan and Dorothy Bishop. "Research Integrity: Don't let transparency damage science." Deep Dive: John, Stephen. 2018. "Epistemic trust and the ethics of science communication: against transparency, openness, sincerity and honesty." (First case study due 2.26 by end of day)
8	2.27	Responsibility and Democracy		Schroeder, S. Andrew. "Thinking about Values in Science: Ethical versus Political Approaches." <i>Recommended:</i> Alexandrova, Anna and Mark Fabian. 2022. "Democratising Measurement: or Why Thick Concepts Call for Coproduction."
	3.1	Responsibility Across Sectors		Herman, Edward S. "Corporate Junk Science in the Media" <i>Recommended:</i> Rich, Nathaniel. "The Lawyer Who Became DuPont's Worst Nightmare." Cranor, Carl F. "The Dual Legacy of <i>Daubert v. Merrell-Dow Pharmaceutical</i> ."
	3.3		Seminar	Kennewick Man, Collaborative Archaeology, and Descendent Populations Overview 1: National Park Service Summary of Work (link) Overview 2: Balter, Michael. "Mystery Solved: 8500-year-old Kennewick Man is Native American after all." Overview 3: Killgrove, Kristina. "How One Anthropologist Balances Human Skeletons and Human Rights." Deep Dive: Wylie, Alison. "Community-Based Collaborative Archaeology." (GATech Library Link)
9	3.6	Industry Connections (Commercializing Science)		Fernandez Pinto, Manuela. "Science and industry Funding." <i>Recommended:</i> Biddle, Justin. 2010. "Bringing the Marketplace into Science: On the Neoliberal Defense of the Commercialization of Scientific Research."
	3.8	Industry Connections (Agnotology)		O'Connor, Cailin and James Weatherall. Selection from <i>The Misinformation Age</i> . <i>Recommended</i>

				Oreskes and Conway, "Doubt is Our Product." Holman, Bennett and Justin Bruner. "Experimentation by Industrial Selection."
	3.10		Seminar	Biomedicine and Big Money Overview 1: Weatherall, David. "Academia and industry: increasingly uneasy bedfellows." Overview 2: "Is the university-industrial complex out of control?" Deep Dive: Angell, Marcia. "Drug Companies & Doctors: A Story of Corruption."
10	3.13	Experiments (Animals)		Singer, Peter. "All Animals Are Equal."
	3.15	Experiments (The Precautionary Principle and Geoengineering)		Ott, Konrad. "Might Solar Radiation Management Constitute a Dilemma?" <i>Recommended:</i> Elliot, Kevin. "Geoengineering and the Precautionary Principle."
	3.17		Seminar	Animal Experimentation Overview 1: Rowan, Andrew N. "The Benefits and Ethics of Animal Experimentation" Overview 2: Barnard, Neal D and Stephen R Kaufman. "Animal Research is Wasteful and Misleading" Overview 3: Botting, Jack H and Adrian R Morrison. "Animal Research is Vital to Medicine." Deep dive: Birch, Jonathan et al. "Review of the Evidence of Sentience in Cephalopod Molluscs and Decapod Crustaceans"
11	3.20	NO CLASS		
	3.22			
	3.24			
12	3.27	Question Period		
	3.29	Exam		
	3.31	NO SEMINAR		
13	4.3	Human Subjects (Informed Consent)		The Belmont Report (link) The Nuremberg Code (1947) (link) Declaration of Helsinki (1964) (link) <i>Recommended</i> McArthur, "Good Ethics Can Sometimes Mean Better Science." Skloot, Rebecca. 2013. "The Immortal Life of Henrietta Lacks, the Sequel." (link)
	4.5	Human Subjects (Global Issues)		Angell, Marcia. 1997. "The Ethics of Clinical Research in the Third World." <i>Recommended</i> Hausman, Daniel M. 2007. "What's Wrong with Health Inequalities?"

	4.7		Seminar	<p style="text-align: center;">Havasupai DNA</p> <p>Overview: Harmon, Amy. "Indian Tribe Wins Fight to Limit Research of Its DNA."</p> <p>Deep Dive: Drabiak-Syed, Katherine. "Lessons from Havasupai Tribe v. Arizona State University Board of Regents: Recognizing Group, Cultural, and Dignitary Harms as Legitimate Risks Warranting Integration into Research Practice." (Focus on §I.C, III., IV.E.1–3)</p>
14	4.10	Data Ethics (Algorithmic Bias and Blame)		<p>Benjamin, Ruha. "Assessing Risk, Automating Racism."</p> <p>D'Ignazio, Catherine and Lauren F. Klein. Selections from <i>Data Feminism</i>.</p> <p style="text-align: center;"><i>Recommended:</i></p> <p>O'Neil, Cathy. 2016. <i>Weapons of Math Destruction</i>. Crown, pp. 1–8, 84–104.</p>
	4.12	Data Ethics (Privacy)		<p>Nissenbaum, Helen. Selection from <i>Privacy in Context</i>.</p> <p style="text-align: center;"><i>Recommended</i></p> <p>Gilliard, Chris. "Caught in the Spotlight" (link)</p> <p>Valentino-deVries, Jennifer, et al. "Your Apps Know Where You Were Last Night, and They're Not Keeping It Secret." (link)</p> <p>Skopek, Jeff M. "Untangling privacy: losses versus violations."</p>
	4.14		Seminar	<p style="text-align: center;">Algorithmic Colonialism</p> <p>Overview: Maxmen, Amy. "Can tracking people through phone-call data improve lives?"</p> <p>Overview: Chutel, Lynsey. "China is exporting facial recognition software to Africa, expanding its vast database." (link).</p> <p>Overview: Solon, Olivia. "'It's digital colonialism': how Facebook's free internet service has failed its users." (link)</p> <p>Overview: LaFrance, Adrienne. "Facebook and the New Colonialism." (link)</p> <p>Deep Dive: Oyedemi, Toks Dele. "Digital coloniality and 'Next Billion Users': the political economy of Google Station in Nigeria."</p> <p style="text-align: center;">(Second case study analysis due 4.16 by end of day)</p>
15	4.17	Neuroethics (Addiction & Free Will)		<p>[Podcast] Barry Lam. Willful Acts. <i>Hi-Phi Nation</i>. (link)</p> <p style="text-align: center;"><i>Recommended:</i></p> <p>Caplan, Arthur. 2008. "Denying autonomy in order to create it: the paradox of forcing treatment upon addicts."</p>
	4.19	Neuroethics		<p>Greene, Joshua and Jonathan Cohen. 2004. "For the law, neuroscience changes nothing and everything."</p>
	4.21		Seminar	<p style="text-align: center;">Neuroscience and the Law</p> <p>Overview: [Video] Brains on Trial. PBS Special. Watch at least the first of the two episodes: (link)</p> <p>Deep Dive: Walter Sinnott-Armstrong, Adina Roskies, Teneille Brown and Emily Murphy. "Brain Images as Legal Evidence."</p>
16	4.24	Exam		

ASSESSMENT

The assessment of this course is meant to reward *participation and engagement with the course*. This because the skills crucial for philosophical work are critical thinking, charitable interpretation, and reflecting on (partial) successes and failures.

Assignment	% of total grade	Assessment	Grade Scale
Exam 1	7	Excellent (7) Satisfactory (4) Insufficient (0)	A: 90–100
Exam 2	21	Essay Response Rubric	B: 80–89.5
Exam 3	21	Essay Response Rubric	C: 70–79.5
Readings	11	Complete Incomplete	D: 60–69.5
Participation	11	As below	F: 0–59.5
Essay Responses	28 (14 each)	Essay Response Rubric	
CIOS	—	Two "incomplete" readings dropped if >80% complete the survey by 4.31	

Attendance and Missed Classes:

Showing up is required and expected for both lectures and seminars.

Though there is no penalty for missing a single session—there are repercussions for missing multiple classes. If you miss more than 6 sessions, your final grade is docked by 10 percentage points, 8 or more sessions 15 points, and 10 or more sessions 30 points.

Only serious circumstances of serious medical illness, bereavement, or other emergencies will be "excused" absences. Documentation will be required for excused absences.

Exams (L1, L2, L3):

There are two main modes of assessment. The first are in-class exams. The second are case study analyses (addressed below).

The exams will consist largely of short-answer responses. The questions will draw from the lecture material and the required readings for the lecture sessions. The first exam is something of a "warm-up" to get up to speed with writing short-answer essay responses and will be marked accordingly. The second and third exam will be evaluated according to the essay rubric ([link](#)).

Readings (L1, L2):

You'll be required to do some reading for each session.

For the Monday and Wednesday lecture sessions, these will be readings marked out on the syllabus. For the Friday seminar sessions, only the "overview" articles will be required. I try to keep these readings short—but occasionally these may total 30 pages. If they are longer, they will tend to be approachable readings, or have lots of pictures. The remaining readings (recommended readings, "deep dives"), or links to them, will be found on Canvas.

You will be engaging with these readings through the Perusall system, an online platform that allows for interaction and engagement with your peers. Perusall uses AI to evaluate your engagement with the text, looking at the time spent reading, and the quality of your contributions. In order to receive

marks for completing the reading, you must **complete** the reading **by 7:30AM prior to the relevant session**. This is true for both lecture and seminar sessions.

In addition, you are required to make at least **three** substantive comments per reading—though I encourage you to use the platform as a place to express your uncertainties, questions, and confusions. Your TAs and I will engage with these comments in preparation for each session.

As noted above, Perusall employs a system to track your completion of the assignment. For better or worse, this means that *you must be connected to the internet while you complete these readings*. If you encounter a persistent problem in accessing the internet that makes this a problem, please contact me or the TAs to discuss accommodations.

Perusall also employs its AI to evaluate your comments. In reading through your comments, however, your TAs and I may change Perusall's evaluation in accordance with the following criteria. These set out the standard for substantive contributions, namely those that:

- a. Outline the argument of the section/paragraph and relates it to the goals of the paper;
- b. Point to a technical concept or distinction, and provides some clarification of what it means in context;
- c. Raise a question about an argument, concept, distinction, or piece of evidence and articulates why this question is important (for instance, if you are confused about what something means, explain what you are confused about);
- d. Provide a useful explanation of a difficult stretch of text; or
- e. Relate concepts, topics, or themes to other elements of the course in an interesting and illuminating way.

As noted above, you must complete the reading **by 7:30AM**—after this point, the system will not track your efforts.

Participation (L1, L2, L4):

Participation will be evaluated in two ways.

First: at least two hours before your seminar, you must submit one question or topic of discussion to the Piazza associated with that week. These questions or topics should be related to the week's seminar readings but may draw from your own experience or other classes. You may post this question anonymously—but you should be prepared to ask your question, or to address your topic, in class.

Each week that you successfully submit a relevant question or topic of discussion will garner 0.5 percentage points towards your final grade. Over the eleven seminars of the semester, this totals to 5.5 percent of your final grade.

Second: your seminars will involve discussion. This will begin with an analysis of the case study (or studies) under consideration but will also draw upon the questions and topics submitted prior to class. The remaining 5.5 percentage points of 'participation' are based on a holistic assessment of the regularity and quality of your contributions. This is evaluated in line with the participation rubric ([link](#)).

Case Study Analysis (L1, L2, L3):

The second main element of assessment are case study analyses. These are essays—between 1200 and 1600 words long—that provide a philosophical analysis of one of the case studies examined in your seminars. Importantly, these case study analyses must draw not just on the seminar readings but also at least one the "deep dive" reading associated with the seminar session.

So, for instance, if you are writing on the seminar material from Week 3 (Spidergate), you must not only analyze and address concerns from the Kolzov reading, but also one (or both) of the associated deep dive readings by Laskowski or Bolnick.

These case study analyses should analyze the scientific conduct of one or more of the actors discussed in the case study by articulating the relevant standards and principles, and evaluating the actor(s) behavior. More information on writing these case studies will be discussed in class in week 6, and will be displayed on the assignment page on Canvas.

Your first case study analysis can be drawn from any of the seminars from weeks 2-7 and is due by the end of day on **February 26th**. The second case study analysis can be drawn from any of the seminars from weeks 8-10 and 12-15 and is due by the end of day on **April 16th**.

Note that the due date for the second case study analysis is the **end of week 14**. Thus, if you want to provide a response to the material covered in week 15, you will have to work ahead.

These essays will be evaluated with the essay rubric ([link](#)).

THE TERMS AND CONDITIONS

Academic Integrity and Collaboration:

Honesty and transparency are important features of good scholarship. On the flip side, plagiarism and cheating are serious academic offenses with serious consequences. If you are discovered engaging in either behavior in this course, you will earn a failing grade on the assignment in question, and further disciplinary action may be taken.

Your discussion responses, summative essays, and reflective exercises should be crafted and written on your own. You may talk with others about your ideas—you may even use the ideas discussed in class seminars—but these ideas must be made your own. That means working by yourself to develop your own ideas, providing your own reasons, and explaining things in your own words.

Note that in this class, the use of chat GPT or other text generating software will be seen as a violation of academic integrity.

In your case study analyses, you are required to cite all sources you use. This includes both direct quotations and cases where you use someone else's ideas. "Sources" include papers, journals, conversations, anything found on the internet, and so on. Basically, if the thought did not originate with you, you should provide an in-text citation and a reference list. For a clear description of what counts as plagiarism, cheating, and/or the use of unauthorized sources, please see the Student Code of Conduct: <http://www.catalog.gatech.edu/rules/19>.

If you have questions about my integration of the university's honor code into this course, please do not hesitate to ask: my aim is to foster an environment where you can learn and grow, while ensuring that the work we all do is honest and fair. For more information about Georgia Tech's standards with respect to academic integrity, you can also check out the following link: <http://honor.gatech.edu/>

Accommodations for Students:

If you wish to request an accommodation due to a documented disability, please contact Disability Services as soon as possible. They can be reached at dsinfo@gatech.edu or 404-894-2563 (voice)/404-894-1664 (TDD). If you do have a documented disability, I or your TAs will make time available to discuss your ODS letter. These meetings will take place via Teams—please do not come to office hours to discuss these letters.

I encourage you to discuss with me what you need to succeed—if you need direction, assistance or accommodation, please get in touch with me as soon as possible. I also encourage you to make use of the academic and pastoral resources at <https://success.gatech.edu> and <https://mentalhealth.gatech.edu/>

Extensions, Late Assignments:

Time management is important. Late submissions and extensions **will not be permitted**. If you think you are subject to an exceptional circumstance, please discuss it with me outside of class (and as soon as possible). In general, only circumstances covered by an ODS letter, or situations of medical, family, or technological emergency will warrant an extension.

Student-Faculty Expectations and statement on inclusion:

To produce a positive teaching and learning environment—especially in seminar discussions— instructors (myself and your TAs) and students must engage in an environment of mutual trust. Such an environment is characterized by respectful language and imagery, punctuality and care for others' time, clear and thorough communication, access to resources, and an openness to dialogue and debate. I and your TAs are committed to such a respectful environment and encourage the highest standards of ethical and academic conduct. For more on Tech's policies on this matter, please consult: <https://catalog.gatech.edu/rules/22/>

As part of this, I and your TAs are committed to fostering students from all diverse backgrounds and perspectives. We see such diversity as both a resource and a strength and endeavor respect and support this diversity, which includes (but not limited to): gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

I also encourage and appreciate suggestions for ways that the classroom can better support learning, inclusion, and the effectiveness of the course for you personally, or for other students or student groups.

Student Use of Electronic Devices in the Classroom:

Unless by prior arrangement—for instance, your computer has died—I do not allow mobile phones. Keep them in your bags and on silent.

I encourage you to keep your computers turned off and in your bag during class.