APHI 418/520 – Philosophy of Science

"The only way forward is by enhancing the trustworthiness of the scientific community and by being more realistic about the limits of science"

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Day and time: Tuesdays & Thursdays, 1:30 – 2:50 pm
Place: HU 027

Office hours: Mondays 10 am -12 pm; HU-253 & on Zoom by appointment.

Everyone is welcome to my office hours. Even though it can be intimidating or feel like extra effort, this one-on-one time with me will give you the chance to ask the questions you did not ask in class, receive further clarification about the material, or dive deeper into issues that particularly interest you without outside distraction, judgment, or pressure. Coming to office hours does NOT mean that you are 'dumb' or that you 'don't get it'!

Course description:

We live in an era where the more scientific knowledge is produced, the more it gets questioned. We live in the era of 'alternative facts', fake news, and conspiracy theories. In this era, your typical Philosophy of Science course won't work. Yes, we will still discuss some of the more traditional issues, such as the relationship between theory and experimentation, data and phenomena, what distinguishes 'proper' science from pseudo-science, or the nature of scientific 'revolutions'. In the second part of the course, we will address the socio-political aspects of scientific research, guided by two 'popular science' books. Through the reading of *Why trust science?* and *Merchants of Doubt*, we will gain a better understanding of how science works as well as develop the critical skills necessary to decide which scientific claims should be believed and which ones shouldn't.

After taking this course, you will be able to:

- Master basic concepts such as theory, experimentation, confirmation, etc.;
- Reconstruct and present particular philosophical views in a clear and organized way;
- Gain critical insight into popular past and present scientific debates such as those around tobacco smoke, acid rain, or global warming;
- Appreciate and understand historical, sociological, and political influences on science;
- Develop critical thinking skills to employ during everyday engagement with society and the media.

Course books:

1. Peter Godfrey-Smith (2021). *Theory and Reality* (2nd Edition). University of Chicago Press.
2. Immaculada de Melo-Martín & Kristen Intemann (2018). *The Fight Against Doubt.* Oxford University Press.

3. Naomi Oreskes & Erik M. Conway (2010). *Merchants of Doubt.* Bloomsbury Press.
4. Naomi Oreskes (2019). *Why trust science?* Princeton University Press.

Books 2, 3 and 4 will be available in digital format on Brightspace. Book 1 can be purchased at the University bookstore or online. All other readings are also available on Brightspace.

What you need to do to succeed in this course:

- Come to class, be on time, don't leave early unless it is an emergency. If you must miss a class or part of a class, please let me know in advance.
- Actively participate and engage. This can be done in many ways; you don't have to raise your hand and speak up in class if you don't feel comfortable doing it.
- Be kind and respectful. Why is respect important? And what does "respect" mean to you? Let's talk about it!
- Communicate and be responsive. If something I say in class isn't clear, ask. If you are falling behind, do not be afraid to reach out. If I email you, reply promptly (I will do the same!). If you have doubts about how to complete an assignment or have questions about what's expected of you, share those with me right away.
- Take care of yourself. Semesters are long and taxing, and you will naturally have ups and downs. If you notice your mental health isn't great at any point in the semester, try your best not to isolate yourself: keep coming to class and communicate with me so I can help you stay on track.

Assignment 'bundle' for 418

- Attendance and Participation: 15%
- Case-study presentation (in pairs): 20%
- Midterm exam: 20%
- Paper pitch:15%
- Research paper (~2000 words): 30%

Assignment 'bundle' for 520

- Attendance and Participation: 15%
- Peer instruction session: 20%
- Case-study presentation (in pairs): 20%
- Paper pitch: 15%
- Research paper (~5000 words): 30%

Religious Commitments:

If you think your religious commitments may impact your course work at any point during the semester, please let me know as soon as possible so that we can discuss the best strategy for accommodating your needs.

Academic Integrity:

All forms of academic dishonesty, including but not limited to cheating and plagiarism (i.e. using the words of other people or AI bots as your own), will not be tolerated and will result in failing the course. As UAlbany students, you make a commitment to respecting the Standards of Academic Integrity Policy. You should familiarize yourselves with the policy and its subsections at https://www.albany.edu/dean-students/community-standards/standards-academic-integrity and take advantage of the resources offered by the University Libraries regarding cheating, plagiarism, and how to properly cite your sources.

A note about Generative AI (ChatGPT etc.):

Generative AI bots like ChatGPT, Gemini, Claude, etc. do not replace your own ability to think. Indeed, extensive use of ChatGPT has been recently linked to declining academic performance, increased procrastination, and memory loss (https://tinyurl.com/2byaafxh).

In this course, using the words of AI bots like ChatGPT as your own on any assignment is considered cheating. As such, it will result in being failed for the course and reported to the appropriate UAlbany authorities.

AI bots can however be used to assist you in completing assignments by brainstorming ideas, summarizing the readings, composing 'cheat sheets' to study for exams, etc. If you are not sure if a certain use of AI is ok, feel free to ask me!

(Dis)ability and Learning:

If you have a disability and would like to request accommodations, you should get in touch with Disability Access and Inclusion Student Services (DAISS) at https://www.albany.edu/dean-students/disability . All information and documentation you provide is confidential.

Even if you do not require specific accommodations, please let me know if there is anything I can do (within reason) to facilitate your learning.

Electronics in the classroom:

You are allowed to use computers or tablets in the classroom to take notes if you so choose, but be aware that they can be sources of distraction and interfere with your (and others') ability to follow what's going in class. You are not as good at multitasking as you might think: https://time.com/4737286/multitasking-mental-health-stress-texting-depression/

You are encouraged to take notes by hand, if you are able.

Communications:

I will communicate with you via email and through Brightspace, so make sure you check your university email (username@albany.edu) regularly. I will try to answer your emails within 24 hours (excluding weekends): if you don't receive an answer from me by then, feel free to reach out again!

Assignment descriptions:

Case-study presentation
In pairs or small groups, you will pick a case-study of 'science gone wrong' from either *Why Trust Science?* or *Merchants of Doubt*, consult at least one more source on the topic, and prepare a short critical presentation for the class. List of available case-studies and sign-up sheet on Brightspace.

Midterm exam
If you are enrolled at the 400-level, the exam will consist in 6 open-ended questions. The exam will be hand-written in class, but you'll be able to consult your own notes.

Peer instruction session
If you are enrolled at the 500-level, you will be 'instructor for a day' and teach a section of the textbook (available chapters **in pink**). On your scheduled day, you will:

1) Introduce the topic and explain the main points of the chapter;
2) Lead the discussion;
3) Administer a short 'knowledge test' at the end (and grade it).

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N. B. I do not grade on a curve. I make this choice for several ethical and pedagogical reasons that align with what I believe teaching and learning should be about. If you are curious about what my specific reasons for not curving grades are, feel free to ask!

SCHEDULE OF TOPICS AND READINGS
(The schedule is tentative and could change as we go)

Week 1: Introduction
08/26 Introductions, course ground rules, and initial discussion
Read: *Science for All Americans*, ch.1
Theory and Reality, ch.1.
08/28 Initial discussion continued

Week 2: Empiricism and the Problem of Induction
09/02 *Theory and Reality*, ch.2-3
09/04 Harman, "Inference to the best explanation"

Week 3: Popper
09/09 *Theory and Reality,* **ch.4**
09/11 Salmon, "Rational prediction"

Week 4: Kuhn, Lakatos, Laudan
09/16 *Theory and Reality,* **ch.5**
09/18 *Theory and Reality,* **ch. 6**

Week 5: Scientific Realism
09/23 *Theory and Reality,* **ch. 10.**
09/25 ***(Class will be VIRTUAL)*** Chirimuuta, "Vision, Perspectivism, and Haptic Realism"

Week 6: Observation and Measurement
09/30 Hacking, "Do we see through a microscope?"
10/02 Isaac, "Epistemic Loops and Measurement Realism"

Week 7: Data and Phenomena
10/07 Bogen & Woodward, "Saving the phenomena" (up to section VI)
10/09 Napoletani, Panza & Struppa, "Agnostic Science. Towards a Philosophy of Data Analysis"

Week 8:
10/14 No class (Fall break)
10/16: Midterm exam (418 students) and Research workshop (520 students)

Week 9: Science and Society
10/21 *Theory and Reality,* **ch. 7**
10/23 *Theory and Reality,* **ch. 9**

Week 10: Science is political
10/28 *Theory and Reality,* **ch. 8**
10/30 *The Fight Against Doubt,* **ch. 3**

Week 11: Science is political (continued)
11/04 *The Fight Against Doubt,* **ch. 8-9**
11/06 *The Fight Against Doubt,* **ch. 10-11**

Week 12: Feminist Philosophy of Science
11/11 Longino, "Gender, Politics, and the Theoretical Virtues"
11/13 Harding, "A Socially Relevant Philosophy of Science? Resources from Standpoint Theory's Controversiality".
Optional: Richardson, "Feminist philosophy of science: history, contributions, and challenges".
11/14: Deadline to submit first draft of research paper

Week 13: Science 'gone wrong'
11/18: Case-studies presentations & discussion

11/20: Case-studies presentations & discussion

Week 14: Thanksgiving break

Week 15: Paper pitches
12/02: Research papers pitches & discussion
12/04: Research papers pitches & discussion
12/09: Deadline to submit final draft of research paper