Understanding Science

Philosophy 218, Fall 2023 TuTh 12:00-1:20PM HU 124

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Texts: All course readings are available on Brightspace.
I strongly encourage you to read actively and to mark up the readings.

This course is an introduction to some issues in the philosophy of science. This includes the nature of scientific inference and knowledge, but we will also consider the relationship between science and society. Some questions we'll consider include:

- What kind of activity is science?
- What sort of social organization makes for the most productive science?
- Should science set its own agenda, or should it be guided by our social aspirations?

Requirements and grading:

10%	reading response papers
10%	short papers
25%	first midterm exam
25%	second midterm exam
30%	final exam

Class attendance and participation: You should come to class and participate in discussion, but the class is large enough that I won't check for this every day. Instead, participation in class activities and discussion will add to your grade, up to two-thirds of a letter grade. For example, a B could become an A–.

Reading response papers: You will be responsible for writing five reading response papers during the term. These may be written for any five readings, but must be turned in *before* we have discussed the readings in class. The dates on this syllabus are my best guess for that, but response papers turned in after class has started to discuss the reading will not be accepted for credit.

- Each reading response should begin by quoting one or two sentences from the reading which you think best provide the **central thesis** of the reading. *Often the thesis is not concisely stated on the first page!*
- The quoted passage should be in quotation marks and you should indicate which page of the reading it appears on.
- The reading response should then include an explanation of the thesis in your own words. What **reasons** does the author give for believing the thesis? Why do they think it matters?
- That part in your own words should be at least 250 words.

Short papers: You will be responsible for writing two short papers (about 3 pages or 750–1200 words) on assigned topics. They will be due Sep 26 and Oct 31.

Exams: There will be three exams. The final exam will be cumulative.
Exams will either be in-class.

Academic honesty: Cheating will not be tolerated. Papers and exam answers should be your own words.

Absences: If you will need to miss exam or due dates for foreseeable reasons, you should discuss them with the professor at the beginning of the term. If you are sick— or might be— then you should not come to class. You are welcome to follow up in office hours about material you missed.

Schedule of topics

This is a provisional and approximate schedule. I have indicated which readings we will discuss in each week, but even this might be nudged one way or another. I will always announce in class what we will be doing at the next meeting. In any case, exam dates will not change.

Week 1 Aug 22, 24
Introduction
How should you decide what to believe? — *read:* Peirce, "The Fixation of Belief"

Week 2 Aug 29, 31
Kinds of inference — *read:* notes on inference

Week 3 Sep 5, 7
Demarcation — *read:* Laudan, "The Demise of the Demarcation Problem"

Week 4 Sep 12, 14
Norms of science — *read:* Merton, "Science and Democratic Social Structure"
Peer review — *read:* Smith, "Classical peer review: an empty gun"

Week 5 Sep 19, 21
Review
FIRST EXAM Thursday Sep 21

Week 6 Sep 26, 28
SHORT PAPER #1 due Sep 26
The analogy between theories and maps — (no reading)
Scientific expertise — *read:* Collins+Pinch, "ACTing up"

Week 7 Oct 3, 5
Observation and experiment — *read:* Pinch, "Towards an Analysis of Scientific Observation"

Week 8 Oct 12
FALL BREAK — no class Oct 10
What makes science significant? — *read:* Kitcher, "Scientific Significance"

Week 9 Oct 17, 19
Scientific significance, continued
Science and values — *read:* Douglas, "The structure of values in science"

Week 10 Oct 24, 26
Values and science, continued
SECOND EXAM Thursday, Oct 26

Week 11 Oct 31, Nov 2
SHORT PAPER #2 DUE Oct 31
Case study: genetics and IQ — *read:* Gould, "The hereditarian theory of IQ"

Week 12 Nov 7, 9
Women in science — *read:* Oreskes, "Objectivity or heroism?"

Week 13 Nov 14, 16
Crafting doubt and the Tobacco Strategy — *read:* Fernández Pinto, "To Know or Better Not To"

Week 14 Nov 21
Case study: Climate change — *read:* Oreskes, "The Scientific Concensus on Climate Change"
THANKSGIVING — no class Nov 23

Week 15 Nov 28, 30
Climate change, continued
Conclusion

FINAL EXAM Tu Dec 12 8:00–10:00AM

General education

This course satisfies the *Humanities* and *Challenges for the 21st Century* General Education requirements. Like all Gen Ed courses, this course...

- Offers explicit understandings of the procedures and practices of disciplines and interdisciplinary fields.
- Provides multiple perspectives on the subject matter, reflecting the intellectual and cultural diversity within and beyond the university.
- Emphasizes active learning in an engaged environment that enables students to be producers as well as consumers of knowledge.
- Promotes critical inquiry about the assumptions, goals, and methods of various fields of academic study and the interpretive, analytic, and evaluative competencies central to intellectual.

As a *Humanities* course, this course provides...

- An understanding of the continuing relevance of the objects of study to the present and to the world outside the university.
- An ability to employ the terms and understand the conventions particular to the disciplines (Philosophy of Science and Science Studies).
- An ability to analyze and assess the strengths and weaknesses of ideas and positions along with the reasons or arguments that can be given for and against them.
- An understanding of the nature of the texts, artifacts, ideas, or discourse of the discipline and of the assumptions that underlie this understanding, including those relating to issues of tradition and canon.

As a *Challenges for the 21st Century* course, this course provides...

- Knowledge and understanding of the historical roots, contemporary manifestations, and potential future courses of important challenges students may encounter as they move into the world beyond the university;
- Familiarity with these challenges in areas such as cultural diversity and pluralism, science and technology, social interaction, ethics, global citizenship, and/or others;
- An integrated understanding of how challenges often affect individuals and societies simultaneously in many of these areas;
- An appreciation for interdisciplinary approaches to understanding contemporary and future challenges.