Understanding Science

Philosophy 218, Spring 2024 MW 11:40–1:00 HU 132

Professor: P.D. Magnus Office phone: (518) 442-4223 E-mail: pmagnus<at>albany.edu
Office: HU-218 Office hours: M 1:00–3:00 and by appointment

Teaching assistant: Marla Hasin E-mail: mhasin<at>albany.edu
Office: HU-255 Office hours: by appointment

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

This course explores the nature of science, drawing insights from philosophy and science studies. Science is not a matter of applying a formal or mechanical method. Instead, it depends on the details of our background knowledge and on the social organization of the scientific community. So it requires considering the boundaries of expertise and the relation between science and broader society. It requires value judgement in weighing the potential benefits of research against the possible costs of different errors. And ultimately, responsible science demands attention to the diversity of our society.

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?
- The 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 Feb 19 and Apr 1.

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

Paper grades: Papers will be marked ✓, ✓+, or ✓-. A grade of ✓ is full credit, and completing all the work with a ✓ will give you an A for that part of your grade. ✓+ is especially good, while ✓- falls short of expectations.

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 Jan 17
Introduction

Week 2 Jan 22, 24
How should you decide what to believe? — *read:* Peirce, "The Fixation of Belief"
Kinds of inference — *read:* notes on inference

Week 3 Jan 29, 31
Demarcation — *read:* Laudan, "The Demise of the Demarcation Problem"

Week 4 Feb 5, 7
Norms of science — *read:* Merton, "Science and Democratic Social Structure"
Peer review — *read:* Gregory et al., "Everything You Need to Know About Peer Review"

Week 5 Feb 12, 14
Review
FIRST EXAM Wednesday, Feb 12

Week 6 Feb 19, 21
SHORT PAPER #1 due Feb 19
The analogy between theories and maps — (no reading)
Scientific expertise — *read:* Collins+Pinch, "ACTing up"

Week 7 Feb 26, 28
Observation and experiment — *read:* Pinch, "Towards an Analysis of Scientific Observation"

Week 8 Mar 4, 6
What makes science significant? — *read:* Kitcher, "Scientific Significance"

Week 9 Mar 11, 13
Science and values — *read:* Douglas, "The structure of values in science"

SPRING BREAK! no class

Week 10 Mar 25, 27
Review
SECOND EXAM Wednesday, Mar 27

Week 11 Apr 1, 3
SHORT PAPER #2 DUE Apr 1
Case study: genetics and IQ — *read:* Gould, "The hereditarian theory of IQ"
Causal inference — *handout on causal inference

Week 12 Apr 8, 10
Women in science — *read:* Oreskes, "Objectivity or heroism?"

Week 13 Apr 15, 17
Crafting doubt and the Tobacco Strategy — *read:* Fernández Pinto, "To Know or Better Not To"

Week 14 Apr 22, 24
Case study: Climate change — *read:* Oreskes, "The Scientific Concensus on Climate Change"

Week 15 Apr 29
Conclusion

FINAL EXAM M May 6 10:30–12:30

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.