

INSTRUCTOR: SHARON MASON

PHILOSOPHY OF SCIENCE

COURSE SYLLABUS FALL XXXX

COURSE DESCRIPTION

This undergraduate course introduces students to central topics in the philosophy of science, both by studying established theories and key concepts in the philosophy of science, as well as by exploring some new directions such as the moral and social obligations of scientists. We will begin by examining what science is, looking in particular at scientific methodology including induction, confirmation, and falsification. This will put us in a position to address questions about the nature of scientific knowledge, such as “What is scientific knowledge?” and “How does it resemble or differ from other ways of knowing?” We will also consider scientific progress, both as it relates to scientific knowledge and in the broader context of scientific revolutions. Next, we will explore the significance of several philosophical commitments that are especially relevant to science, including naturalism and scientific realism. Finally, we will examine whether scientists have any special moral responsibilities given the power and influence they have in our society.

KEY QUESTIONS:

What is science?

What makes scientific inquiry unique?

What is scientific progress?

What is the proper method of scientific inquiry?

Do scientists have special moral obligations?

Are scientific theories *true*?

CONTACT INFORMATION

- *Office Hours:*
M/W, 1-3pm, SY 009
and by appointment
- *Email:*
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“IN SO FAR AS A
SCIENTIFIC
STATEMENT
SPEAKS ABOUT
REALITY, IT MUST
BE FALSIFIABLE:
AND IN SO FAR
AS IT IS NOT
FALSIFIABLE, IT
DOES NOT SPEAK
ABOUT REALITY.”

-KARL POPPER

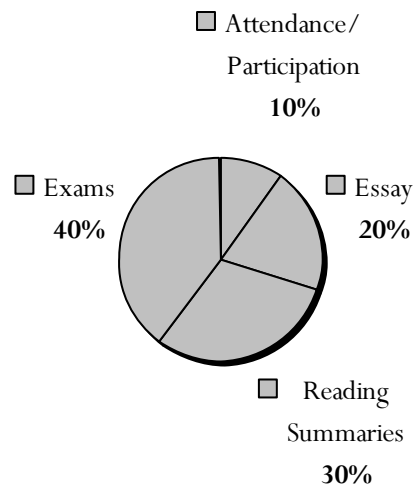


“Science is but an image
of the truth.”
- Francis Bacon

COURSE TEXTS

- McGrew, Tim, Alspector-Kelly, Marc, & Allhoff, Fritz (2009). *Philosophy of science. An historical anthology*. Chichester: Wiley-Blackwell.
- Peter Godfrey-Smith (2003), *Theory and Reality*. Chicago: University of Chicago Press.
- All other readings will be available on Canvas under “Resources.”

GRADING CRITERIA



“SCIENTIFIC
KNOWLEDGE...IS
NOT THE STATIC
END POINT OF
INQUIRY, BUT A
COGNITIVE OR
INTELLECTUAL
EXPRESSION OF AN
ONGOING
INTERACTION WITH
OUR NATURAL AND
SOCIAL
ENVIRONMENTS.”

-HELEN LONGINO

CLASSROOM CONDUCT STATEMENT

This course is designed to encourage you to think deeply about controversial issues, and as we go along you will almost certainly encounter viewpoints that challenge your own beliefs. I encourage you to view these challenges as opportunities to learn about perspectives that may differ widely from your own and to practice the skill of interacting respectfully and sympathetically with someone, despite the fact that you may strongly disagree with their point of view. Although debate and critical analysis are encouraged, it should be clear that we will not discriminate against or criticize members of this classroom community based on gender, ethnic origin, sexual orientation, disability, or religion. Everyone is welcome here.

READING SUMMARIES (30%)



You will need to complete five reading summaries during the semester. Reading summaries are short 1-2 page essays in which you critically engage one of the course readings. In the summary, you should 1) identify the author’s thesis, 2) articulate the basic argument the author

provides for that thesis, and 3) provide at least one question or critical comment. Readings eligible for summaries have been marked with an asterisk (*) on the reading schedule; the choice of which five to complete is up to you. (Keep in mind that shorter is not always easier.) Your read-

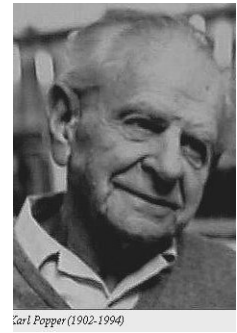
ing summary should be turned in on the day that reading is assigned. Late work is not accepted. Expect to be called upon at some point during the semester to present one of your questions or critical comments to the class for that day’s discussion.

ATTENDANCE/PARTICIPATION (10%)

Much of what you learn in this course will come from your time in the classroom. Unsurprisingly, students who do not attend class regularly will not benefit from the course as much as those who attend regularly. Attendance and active participation in the class are, therefore, required.

Attendance (5%): Each student may take up to 2 excused absences for any reason. Absences in excess of 2 will result in a deduction of 10% from your attendance/participation grade per absence. In cases of an emergency, sickness, death in the family, or other unforeseen event, I may grant additional excused absences provided that the student notifies me right away and provides appropriate documentation.

Participation (5%): Participation is more elusive to assess, but it refers to your active involvement in the class through being prepared for class and engaging in classroom discussion. Visits to my office hours will also count toward your participation grade. Distracting behavior (chronic tardiness, surfing the web on a laptop or mobile device, etc.) will result in points off your participation grade.



Carl Popper (1902-1994)

ESSAY (20%)

Your essay should be a philosophical paper in which you critically engage one of the issues we have covered in the lecture or in the course readings. It may be based on one of your reading summaries or you may choose from a list which I will provide. Either way, the goal is for you to interact with a particular issue

in more depth. All essays should be 1500-2000 words and will be submitted electronically through Canvas. A rough draft of the essay will be due two weeks before your final draft is due. I will be providing detailed comments on your drafts so that you can benefit from those as you write your final draft.

Late Work Policy:

Essays or exams turned in late will receive a 10% reduction of the total assignment points per calendar day that passes after the due date. Extensions may be given, but only for a very good reason and only if arranged in advance of the original due date.

“THE
ANSWERS YOU
GET DEPEND
ON THE
QUESTIONS
YOU ASK.”

-THOMAS
KUHN

EXAMS (40%)

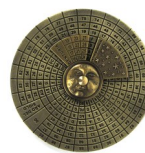
There will be two in-class exams: a midterm, and a final exam. The exams will cover material from both the readings and the class lectures/discussions. The final exam will be cumulative and will be given during the scheduled final exam time.

PLAGIARISM STATEMENT

In the *Code of Student Rights, Responsibilities, and Conduct*, the Indiana University Faculty Council indicates that students may be disciplined for several different kinds of academic misconduct, which include: cheating, fabrication, plagiarism, interference, and violation of course rules. The penalty for cheating or plagiarism in this class is automatic failure of the course. Consider yourself warned. For more information about what plagiarism is and how to avoid it, go to <https://www.indiana.edu/~tedfrick/plagiarism/index2.html>

COURSE SCHEDULE

DATE ASSIGNED:



The following readings are to be completed before
the beginning of class on the date assigned.



Introduction: What is science?

TR, Intro

Peter Dear. *The Intelligibility of Nature*, Intro

Induction and Confirmation

TR, Ch. 3

Francis Bacon, "The Inductive Method" (McGrew)

David Hume, "The Problem of Induction" and "The Nature of Cause and Effect" (McGrew)

*Hans Reichenbach, "The Pragmatic Vindication of Induction" (McGrew)

Falsification

TR, Ch. 4

*Karl Popper, "Science: Conjectures and Refutations" (McGrew)

Revolutions

TR, Ch. 6

*Thomas Kuhn, "The Structure of Scientific Revolution" (McGrew)

Naturalism

TR, Ch. 10

*Barbara Forrester. "Methodological naturalism and philosophical naturalism"

Explanation and Realism

TR, Ch. 12 & 13

*Antoine Lavoisier, "The Nature of Scientific Explanation" (McGrew)

*Richard N. Boyd, "The Current Status of Scientific Realism" (McGrew)

*Bas van Fraassen, "Constructive Empiricism" (McGrew)

Values and Norms

TR, Ch. 9

*Miranda Fricker. *Epistemic Injustice: Power and the Ethics of Knowing*, Ch. 1.

*Helen Longino. "Multiplying subjects and the diffusion of power."

*Heather Douglas. "The moral responsibilities of scientists (tensions between autonomy and responsibility)."

*Eligible for reading summary